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Visualizing Promises of Material Shipments

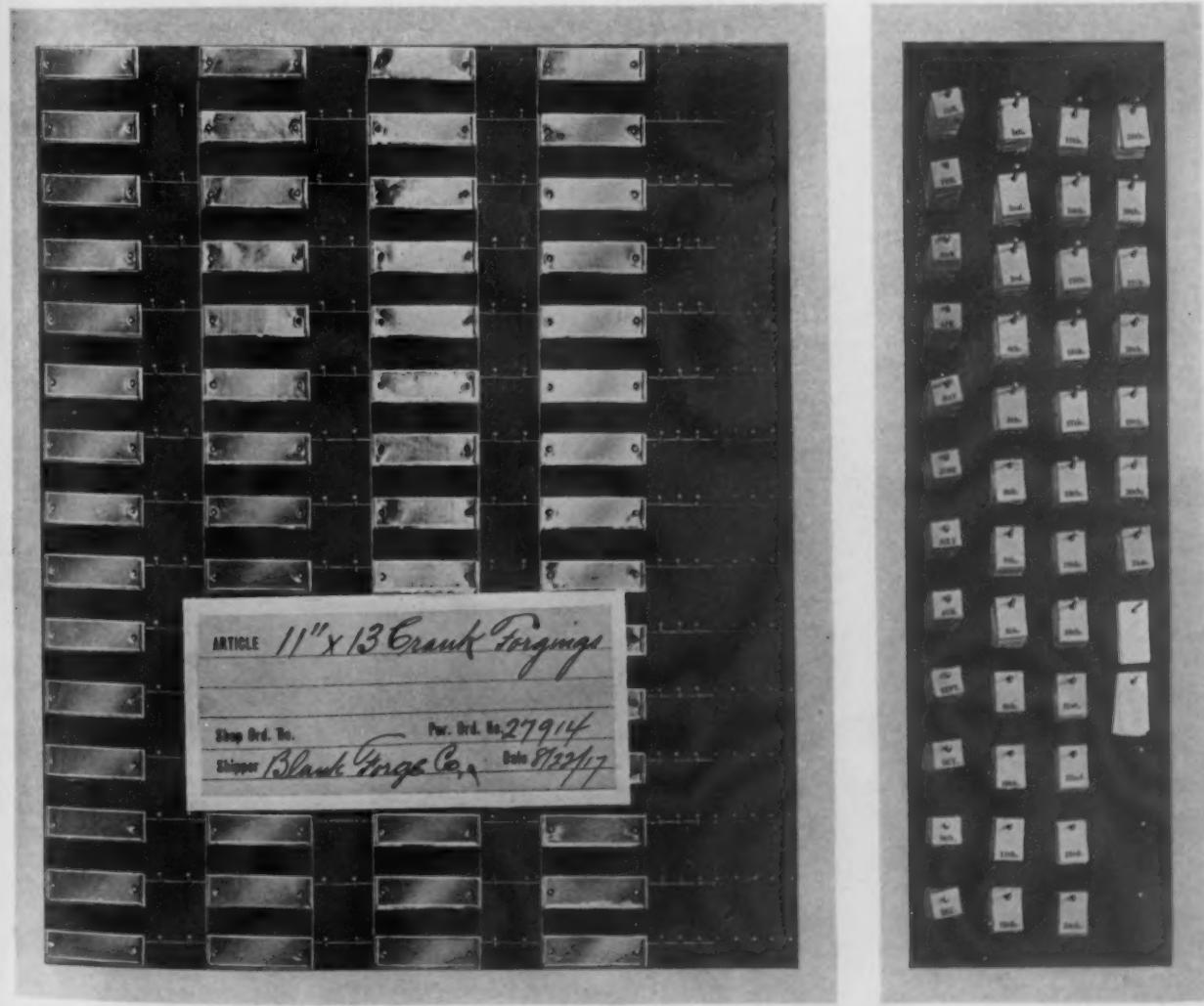
Details of Scheme Followed by a Purchasing Department to Keep Active the Follow-Up Letters Regarding Belated Deliveries

BY H. A. RUSSELL

UNDER normal conditions steel bars were shipped, if the orders were for regular sizes and specifications, in from four to ten weeks from the date of purchase. Malleable castings would come along in five to eight weeks. Pig iron and coke shipments would be made as specified by the buyer. Furthermore, shipments when made had a happy faculty of coming through in periods which were approximately uniform. The buyer knew the average number of days that a shipment would take from Pittsburgh to Philadelphia, or from Chicago to New York. Nowadays all these good old averages are obsolete. Less-than-carload

shipments take much longer to reach their destination in a great many instances. Shipments that check short of a certain number of parts are more in evidence than ever before. All of these delays necessitate closer follow-up of all materials and supplies ordered.

A number of buyers use the card tickler system to keep in touch with promises of shipment of purchased materials. Others keep a list of the important orders before them all the time. In our purchasing department, we fill in a printed slip and place it in one of the cardholders on the promise board here shown. By the color we can tell



Little cards colored for different classes of purchased articles are put in the little pockets and alongside of these on pegs are placed the dates of expected shipments. To the right are pegs for cases in which several dates are set for promised shipments. The smaller board, shown at the right, is employed for holding the non-active signals.

whether the printed slip refers to certain groups of purchases. A yellow slip refers to general orders, such as belting, bolts, valves, pipe and pipe fittings, rivets, etc., also to printed matter. A blue slip covers the various items of steel such as bars, slabs, structural and special sections. A pink slip means that the items specified are either malleable or steel castings.

There are four vertical lines of the cardholders on the promise board and fifteen horizontal lines, so that sixty separate orders can be listed at the one time. In the ordinary factory there will not be more than thirty to forty items that are needed more urgently than the remaining items in the order file. The average here is about thirty, although at times the board has been well filled.

When the buyer is signing the purchase orders he can place a small *x* in the lower left hand corner of the office copy when that particular order is one which it is necessary to follow up closely. The stenographer can then fill out one of the slips of the proper color. When the slips are written out before the copies of the order are filed there can be no possibility of the order being overlooked if the following procedure is given daily attention:

Each morning, after the mail is received and the invoices covering incoming shipments are checked the buyer or his assistant consults the different items on the promise board, making such notations on a scratch pad as will serve the purpose. The memorandum is then given to the stenographer and the copies of all the orders specified on the memorandum are laid on the buyer's desk. The hurry-up and follow-up letters are then dictated and the buyer knows that no important order has been overlooked.

The material covered by certain purchase orders may not be needed very promptly when the order is sent, but later on the situation may change. At the first indication that any item of material is needed ahead of the usual course, a slip is written out and placed on the board.

When a promise of shipment is received, whether by mail, telephone or telegraph, the proper date signals are indicated on the board, on the right hand side of the item in question. It will be noted that there are two brads directly to the right of each cardholder, in the first three vertical columns. When a definite date is specified in the promise of shipment received from the seller, the first brad is used to hold the date signals, but when the promise is not definite both brads are used. For some time past the steel mills, steel and malleable foundries and others have been giving, in a number of instances, promises of shipment which covered a certain period. As an instance we had a promise of shipment covering certain steel castings which read, "We will ship these castings between May 29 and June 5. Under these conditions it is necessary to indicate the minimum and maximum dates.

When the purchase order covers a number of items all of which are needed promptly but which will not all be shipped at the same time, as in the instance of malleable castings, and it is necessary to record the promise of shipment for each item separately, then the fourth column of cardholders is used. Five minimum and maximum dates or ten definite dates may be recorded on the ten brads which are to the right of this row of cardholders.

It is often necessary to order materials from a dozen or more different sources, but all of which cover items needed for one particular customer's order. Without some definite plan to correlate these orders, the buyer may overlook some important item, or at the best it may not arrive at the

factory until all the other items have been received, whereas this particular item should have been among the first to have been received. When we place a group of orders for materials and which are all needed for one factory order, the factory order number is placed on each slip and all of the slips are grouped together on the promise board. By this method the buyer can analyze the condition of each order and their relation to each other. Sometimes we use the descriptive name of the job; at other times the customer's name, in grouping the different purchase orders.

When orders are placed for printed matter the board can be used not only for the purchase order for the printed matter, but also for the necessary cuts or halftones, as sometimes the order is placed for catalogues or price lists before all the halftones are received, and unless these are followed up closely there may be a delay in getting out the catalogue or price list. The date the proof was received can also be indicated.

Once a promise is noted on the board it is not changed, even though the day has passed that is indicated by the date signals. When shipment is not made as promised and a further promise is received, then the date signals are changed to correspond with the new promise. When an invoice is received showing that complete shipment has been made, the slip and corresponding date signals are removed from the board. If it is thought advisable, these slips that are taken off the board can be placed on a smaller board and kept there until the shipment is received. This has not been necessary in our case, as a written notification or a copy of the invoice, minus prices, is sent to the production department and to the foreman of the department for which the material is intended when the item is an important one.

The small board, also here illustrated, is suspended along the wall near the promise board. This smaller board holds the non-active date signals. It is 6 in. wide by 20 in. long. The promise board is 28 x 32 in. and painted a dull or flat black. The cardboard tags showing the days of the month are $\frac{3}{8}$ x $\frac{1}{2}$ in. and are placed on the brads when in service over the month tags, which are $\frac{5}{8}$ x $\frac{7}{8}$ in. There is also another set of plain tags. These are $\frac{5}{8}$ x $1\frac{1}{8}$ in. and are used for several purposes. When in use they are placed underneath both of the other tags. Notations can be made on these longer tags as about $\frac{1}{4}$ in. projects below the month tag. Sometimes it is necessary to hold up a purchase order after it has been placed, and the word "hold" can be written on the exposed space. This prevents the possibility of the suspended condition of the order being overlooked. At other times the notation can be made that part of the order will be shipped as per the date above and the balance on the second date.

This system is not only of value to the buyer, but should he be absent for any reason, almost any one in the office could obtain all necessary information regarding the status of important material orders, and also have a complete list of all material orders pertaining to each customer's order, which information might not otherwise be so grouped that it could readily be obtained in the buyer's absence. As we all know, quick action is often needed at unexpected moments.

The war's effect on merchant shipbuilding is to be discussed at a joint meeting of the American Society of Mechanical Engineers and the Engineers' Club of Philadelphia in Witherspoon Hall, Philadelphia, on Oct. 23, by Homer L. Ferguson, president and general manager Newport News Shipbuilding & Dry Dock Co.



CONCRETE HOUSING DEVELOPMENT

100 Houses Building at Donora for American Steel & Wire Co.

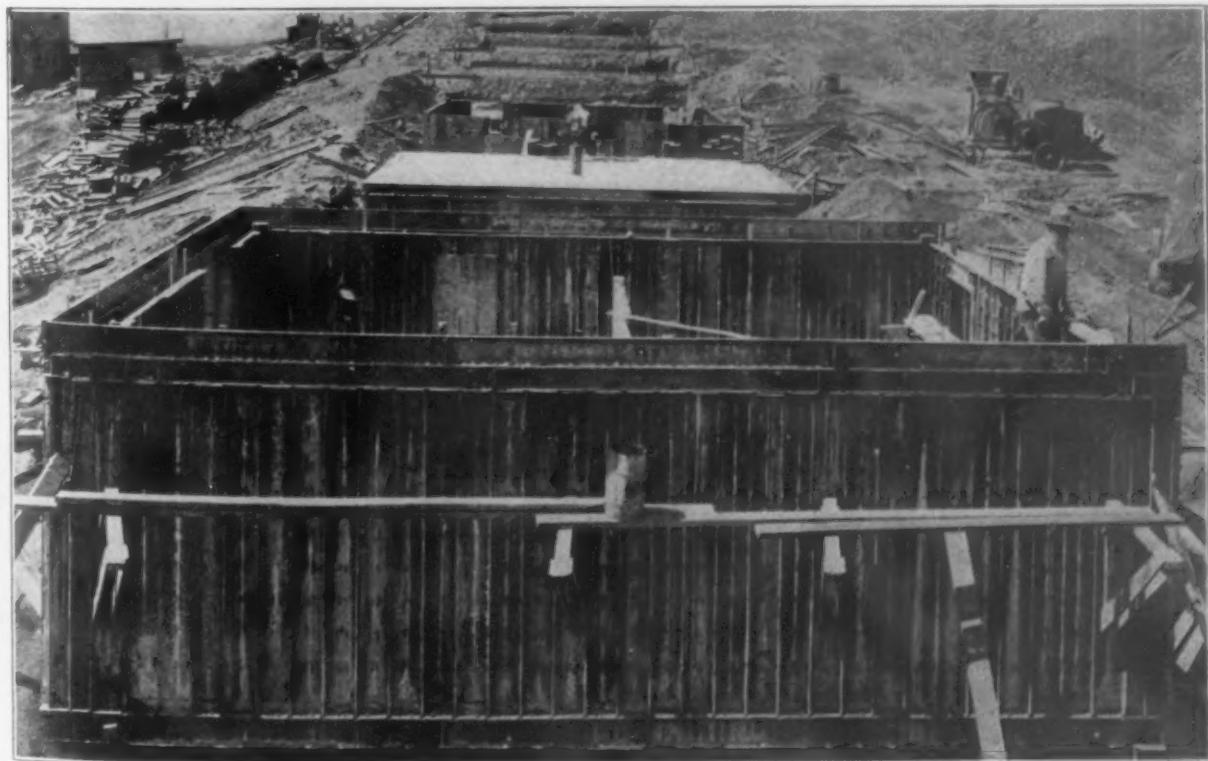
REINFORCED concrete houses to the number of 100 have been built for the American Steel & Wire Co., at Donora, Pa. There are eight different styles, containing some four, some five and some six rooms. Of these, a few are being built in pairs with party walls, and the rest are all detached. Each house has also a bathroom and a full cellar. The site is about 40 miles outside of Pittsburgh and is located on a steep hill above the Monongahela River. The property has been laid out into 156 lots. Grading was done and concrete streets with granolithic sidewalks were laid out by the American Steel & Wire Co. concurrently with the house building, which is being done by the Aberthaw Construction Co., Boston.

The cellars were excavated with a steam shovel, in hard pan and some shale. The walls and floors are of reinforced concrete. The cellar walls are 9 in. thick and the walls of first and second stories 6 in. The buildings were finished at the top with a reinforced concrete cornice in which a gutter was formed, and on top of the concrete ceilings a roof was built up of spruce framing covered with asbestos slate so that the whole of the exterior of the building, with the exception of the window and door frames, is fire resisting. The buildings are all equipped with gas furnaces and cooking ranges, wired for electric lights, and each is fitted with both watercloset and lavatory bowl with hot and cold water. The outside walls are covered with stucco. The concrete is of Universal Portland cement, local sand, and crushed slag, mixed 1:2:5 for cellar

walls and street paving and 1:2:4 for the rest of the work.

Steel forms, patented by the Lambie Concrete House Corporation, were used. These consist of 9-in. channels set up vertically and connected together with clips and wedges passed through slotted holes in the flanges. At the corner of the building a 4 x 4-in. steel angle was set up and the forms lined up longitudinally by means of a steel channel used to form a belt course. This not only fastened the forms of the lower floor, but was bolted into the floor reinforcement and remained in place for a support for the second story forms and was only stripped at the last when all the concrete was poured. The steel wall forms also supported the floor forms, arrangements being made by which steel channels were bolted to the inner side of the steel wall forms upon which the floor centering is laid. Steel domes were used for floor forms. Concrete was hoisted by means of a small derrick bolted to the forms themselves and connected with the hoisting engine which operated the mixer. The usual method was to set the forms for one story wall and floor together, and to pour continually.

To form, pour, and strip each story has taken about seven days. Working at this rate, a house of two floors and cellar is completely concreted in three weeks, and with twelve sets of forms on the job, twelve houses are concreted in this period. The plumbing, heating, plastering, roofing and finish take about five weeks more, so that the houses are being completed at the rate of twelve in the first eight weeks and twelve every three weeks thereafter.



In the Ditch Dug by the Steam Shovel, Steel Forms Made Up of Channel's Are ERECTED for the Concrete and the Spaces Between Houses Are Backfilled

Price Fixing by Edict or Agreement?

Dangers That Result from Arbitrary Action— Importance of Controlling All Factors Entering Into Costs—Questions Which Must Be Considered

BY H. V. COES*

THE writer views with considerable trepidation our recent embarkation in wholesale sociology. As he is not engaged in wholesaling or retailing or interested in any way in any of the commodities whose prices have been or are to be fixed, he feels he is somewhat qualified to deal impartially with the question.

This discussion is not to be construed in any manner as an attack on the Administration, but rather an endeavor to consider facts and to prevent, if possible, a distortion of our perspective.

War to-day is organized business. War's necessities are not peace necessities, consequently many things have to be done when a nation engages in war on a scale such as to-day that are not justified in normal times. But there is the ever present danger that measures may be taken as war's necessity that on closer scrutiny and analysis may prove to be a distortion of perspective due to viewing the measure in particular in the same picture with those gigantic measures that compose war. The armies cannot be supported in the field, financial plans cannot be worked out, or those left behind kept employed if the nation's productive facilities are strangled or jeopardized by any short-sighted or inadequate measures. The man is rash who will prophesy what will happen after the war. One thing is certain, however—people will have to be fed, clothed and housed, and this means employment which in turn means production, that means business which rests on commerce. In other words, somehow, some way, no matter what the state, national or international adjustments may bring, business—commerce—will be conducted in most instances at the same old stand. There is nothing in history to prove to the contrary. That being granted, we must be sane in our conception of wartime measures and keep constantly before us, not way back in the background, the fact that the nation's activities must not be hampered by half-measures—ill-conceived measures or unco-ordinated measures—lest the period of readjustment be made worse after the war than that necessity decrees.

Must Control Cost Factors

It seems axiomatic to the writer that price fixing presupposes price control of all the elements and factors making up the fixed price. Suppose, for example, we consider the price of coal at the mine. That seems to have caused considerable agitation. Without going into too much detail with regard to the factors entering into the cost of a ton of coal at the mine, we can list these:

- (a) Labor—Productive.
Labor—Non-productive.
- (b) Material—Productive.
Material—Expense.
- (c) General expense.
- (d) Administration expense.
- (e) Selling expense.
- (f) Fixed charges.

The various elements making up the main factors might be somewhat as follows:

- A—1. Skilled labor.
2. Unskilled labor.
- B—1. Mine rails and auxiliary material.
2. Explosives.
3. Cables, sheaves, etc.
4. Pumping supplies, etc.

There are a number of other things that have a decided bearing on the cost of production—thin vein mining vs. thick vein mining, location of vein, water conditions and the like. The manner in which the opera-

tions are financed, the character of the lease, the value of royalties, all have a decided influence on the cost.

Some Pertinent Questions

Can the Government guarantee that the wage scale for either skilled or unskilled labor will not advance?

Can it protect the mine operators against an increase in the price of mine rails, cables, cars, explosives, only a few of the things that enter into the cost of mining a ton of coal?

Can the Government fix rates for the various kinds of mining, thin vein, thick vein, the percentage of slate to raw coal, etc.?

Can it protect the operators from an increase in administrative expense due to high cost of living, with consequent salary increase?

Can it guarantee the production per dollar of labor? It is a generally well-known fact that production in many cases has decreased while productive cost has advanced.

We say, can the Government do these things? Let us say, will the Government guarantee the producer of coal, copper, pig iron, steel, flour, any of these things, the control of the major portion of those elements comprising the cost of production? If it will, it has gone all the way and a big step forward in price fixing been taken.

Some one advances the argument that the producer had to meet these conditions when supply and demand fixed the price. To a certain extent, yes; to a greater extent, no. One coal producer, for instance, might sell his product at an advance over the market because he could guarantee a certain B.t.u. content, ash content, sulphur content, percentage of moisture, etc. But unless the price classification is very carefully drawn up, based on all the conditions it is possible to ascertain, the price fixing as at present conceived is sure to work a hardship in certain directions.

The Question of Priority

There is still another phase of the question to consider—priority. This enters into some of the rate fixing plans—steel, for instance. It is the duty of every manager to keep his plant running to full capacity, if possible. A 100-ton lot of coal might probably be worth considerably more to him than the current market price, in order to keep going and fulfill his contracts. He is willing to pay a premium to get it. By price fixing he is deprived of his competitive bidding power. He presents his case to a priority board. He has been forehand and contracted for his supplies. They have been commandeered by a railroad or by the Government. He is at bay. Does anyone believe that a priority board can pass on all the cases of this character that arise, or that it has such an adequate mechanism of stock control in its hands that it can afford the relief in the time necessary to make the relief worth while?

Before we get into wholesale price fixing, let us consider all the available means of regulation, of aiding rather than attempting to suspend economic laws, of means for regulating excess profits. In a great many instances, excess profits will prove to be a myth and the balance on the wrong side of the sheet unless the costs of production for all classifications have been very carefully and accurately determined.

It is the writer's observation that those prices fixed by mutual agreement and understanding have given less dissatisfaction, caused less interference and readjustment than those fixed by edict. In the case of those prices fixed by edict, it is reasonable to assume that all the factors entering into the price were either not known or not carefully enough considered; and that

*Gunn, Richards & Co., New York.

probably the classification was not elastic or comprehensive enough to meet the majority of cases that arose.

Summary.—If prices are to be fixed, they should be fixed by agreement and not by edict. Care should be taken to insure proper classification. Costs, if not adequately known for any given classification, should be definitely determined. Every effort should be made to control the elements comprising the cost of production. Careful consideration should be given to the necessity and advisability of fixing the price.

Great Increase in Exports of Explosives

WASHINGTON, Oct. 9.—A phenomenal movement in the exports of explosives is recorded in an exhibit prepared by the Bureau of Foreign and Domestic Commerce showing the shipments of cartridges, dynamite, gunpowder and other explosives since Jan. 1, 1913, to the end of the fiscal year which closed on June 30 last. The exhibit covers the entire period of the European war and registers a percentage increase that is believed to be without a rival in the exports of any other single class of American products.

The total exports of explosives of all kinds for the calendar year 1913, which include the first five months of the war, amounted to \$5,252,077, made up of cartridges, \$3,015,399; dynamite, \$1,498,222; gunpowder \$359,000, and unspecified articles, \$651,601.

The beginning of 1915 was signalized by a tremendous expansion in the exports of all classes of explosives with the exception of dynamite. Shipments of cartridges rose to \$25,408,079, gunpowder to \$66,922,807, and all other explosives, including loaded shells and shrapnel, to \$95,129,957, making an aggregate for the class of \$188,969,893. But huge as these totals were, they were far exceeded in 1916, when the aggregate of the class rose nearly 300 per cent, every item in the list sharing in the gain, which, however, was most notable in the case of gunpowder and all other explosives. The grand total of the exports for 1916 was \$717,144,649, divided as follows: Cartridges, \$56,996,854; dynamite, \$4,510,197; gunpowder, \$263,790,851, and all other explosives, \$391,846,747.

That the exports of these articles for 1917 will far exceed the enormous figures for 1916 is clearly foreshadowed in the statistics for the first six months ending June 30, last. The four classes for the first half year aggregated \$414,523,991, or at the rate of nearly \$830,000,000 for the calendar twelvemonth. Exports of cartridges totaled \$33,311,945, dynamite \$2,132,487, gunpowder \$169,409,614, and all other explosives \$209,679,975. Every class with the exception of dynamite shows a very substantial proportionate gain over 1916.

Asks for Central Control

WASHINGTON, Oct. 10.—A petition from business to the Government asking for the creation of a central control of all Government purchases has been filed by the Chamber of Commerce of the United States. While not asking directly for the creation of a Department of Munitions, such a department was suggested in this document published to-day by the national chamber. The petition was the substance of a report drafted by a special committee of the chamber of which Waddill Catchings of New York is chairman.

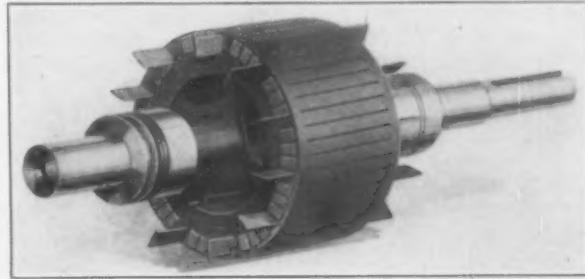
Such an appeal as this is not new to the present Administration at Washington. President Wilson undoubtedly has been told before what business desires and he has undoubtedly given some thought to the suggestion that the control be centralized. There are, furthermore, indications that the President is working along to such an end. The appeal of the Chamber of Commerce of the United States therefore comes at a most opportune moment.

The Pocahontas Pig Iron Corporation, Roanoke, Va., has been organized to operate the Graham, Va., furnace. The company plans for improvements to cost about \$50,000, and expects to blow in the latter part of October, with daily capacity of about 150 tons. John B. Guernsey & Co., engineers, Roanoke, will operate the new organization.

Small Squirrel Cage Induction Motor

Squirrel cage induction motors ranging in size from $\frac{1}{2}$ to 3 hp. have been developed by the Crocker-Wheeler Co., Ampere, N. J. The motors, which are designed for operation at a constant speed on 60-cycle polyphase circuits, have an interesting scheme of ventilation. Use is made of the projections of a number of rotor bars for a short distance at each end of the rotor core to serve as fans. The inside of each of the bearing shields has a pressed steel guide that separates the incoming from the outgoing air, thus enabling air to be drawn into the motor at each end through openings near the shaft and forced by the fan action of the projecting ends of the rotor bars against the stator winding, around the ends, and finally out through the holes near the outer periphery of the shield.

The bearings have sheet metal caps at the ends and self-closing oil well covers to exclude dust and dirt. The oil grooves in the bearings keep a film of oil between shaft and bearings, no matter what the direction of the belt pull. To provide an accurate belt tension adjustment, slotted feet cast integral with the



Extending Some of the Rotor Bars a Short Distance beyond the Ends of the Rotor Core Is Relied Upon to Provide Ventilation in a New Squirrel Cage Induction Motor

stator frame are employed. The stator windings are insulated by placing the coils in insulated slots and the complete core and winding are impregnated with a special varnish to render them immune to moisture and acid fumes. After removal from the impregnating tank, the core and coils are baked and then again dipped in the varnish and baked.

The Iron Age in a Permanent Home

The United Publishers Corporation, New York, publisher of THE IRON AGE, has purchased the building largely occupied by it at 239-243 West Thirty-Ninth Street, through the acquisition of a majority of the stock ownership of the building. The first floor is occupied by the Times Square Station of the New York Post Office; three floors and the basement are occupied by the Federal Printing Co., which is the printing department of the United Publishers Corporation; four other floors are occupied by the publishing offices of the United Publishers Corporation, and the purchase thus guarantees to this publishing business a permanent home under desired conditions and surroundings. The building, which has eleven stories and a basement, and measures 194 ft. 6 in. in frontage and 90 ft. in depth, is located within easy access of both the New York Central and Pennsylvania Railroad terminals and is three blocks from Times Square.

Steel Company's Celebration

The Taylor-Wharton Steel & Iron Co., High Bridge, N. J., is arranging to celebrate Oct. 13, its 175th anniversary and also the twenty-fifth anniversary of the production of manganese steel. An industrial parade will be held in the morning, and games and sports for employees in the afternoon. A community clambake will be held at Riverside Park in the evening, followed by dancing.

The Pedersen Bros. Mfg. Co., Bridgeport, Conn., has been dissolved. The business will be continued by Julius Pedersen under the name of J. Pedersen Machine Co.

American Electrochemists' General Meeting

Papers and Discussions on Electric Pig Iron from Scrap, Corrosion of Steel, Pickling Steel Problems and Melting Brass Electrically

HARDLY a meeting of the American Electrochemical Society is held that does not bear some important message to the steel industry. The thirty-second general meeting, held in Pittsburgh last week, Oct. 3 to 6, was no exception. The over 325 attendants listened to many important papers relating to topics of vital consequence to industrial progress and the prosecution of the war, and they were discussed in a profitable manner. Matters relating to the electric furnace, particularly in making low phosphorus pig iron from scrap; the corrosion of iron and steel, especially copper-bearing metal; the electric melting of brass; the progress in electrochemical analysis, and a symposium on electrochemical war supplies were among the topics. The sessions devoted to papers and discussions were held on Thursday and Friday mornings, the afternoons being devoted to excursions to large industrial plants, laboratories and research institutions in which Pittsburgh abounds.

THE address of welcome on Thursday morning was one that elicited much approbation. It was given by John A. Brashear, president John A. Brashear Co., Pittsburgh, who was introduced by the chairman, Dr. Colin G. Finck, president of the society, as one of Pittsburgh's famous scientists. After calling attention to the city's advantages as a convention town and reciting in a most unique and interesting way his association with S. P. Langley, with Westinghouse and with as many as 180 celebrated scientists in his 77 years of experience, Mr. Brashear closed with the statement that we know not what is yet to come in scientific and other progress as a result of the world war.

Electric Pig Iron from Ore and Scrap Steel

One of the most interesting papers of the convention, from the practical steel standpoint, was "Electric Pig Iron in War Times," by Robert Turnbull, Turnbull Electro Metals Co., St. Catharines, Ontario, Canada. Mr. Turnbull presented an abstract of his paper. It is printed nearly in full in this issue. The author discusses the commercial possibilities of the manufacture of low phosphorus pig iron from steel scrap in an electric furnace with particular reference to post-war conditions and the reasons why electric pig iron direct from ore is not being made now in North America, although the profits appear attractive. The addition of steel scrap to blast furnaces and electric pig iron furnaces is also touched upon as a procedure which is now profitable.

Supplementing his presentation, Mr. Turnbull called attention to the analyses of his product of pig iron from scrap, pointing out that the average of the analyses given in the paper showed the sulphur to be 0.028 per cent and the phosphorus 0.030 per cent. For the last 15 days of September he said the average had been 0.019 per cent sulphur and 0.030 per cent phosphorus. Speaking of the inability to raise the total carbon above 3 per cent in the iron, Mr. Turnbull said that attempts to reach 3.50 per cent had resulted in nearly complete destruction of the roof. The load factor in making iron had been 68, including five shutdowns.

Dr. John A. Mathews, president Halcomb Steel Co., Syracuse, N. Y., after being called upon to open the discussion, said that he had had no experience in making pig iron from scrap in an electric furnace, but desired to know the economical reasons for putting steel scrap back into pig iron instead of directly into refined steel.

Canada's Shortage of Low Phosphorus Iron

Mr. Turnbull's reply was that in Canada there is a decided shortage of low phosphorus pig iron to supply the 20 or more acid open-hearth furnaces in that country of 15 to 25 tons capacity each; that it is almost impossible to get high-grade ores from the United States, and that now no pig iron is available from the States. There is therefore no other way to get such iron except to make it in this way. He made also the surprising statement that 5000 tons per month of steel

barrings and turnings are now being exported from Canada to the United States for use in regular blast-furnace charges. Another answer to Dr. Mathews' query was that there is good money in it.

Edwin F. Cone, associate editor, *THE IRON AGE*, expressed his interest in this subject and commented on the value of Mr. Turnbull's paper. He related that he had been shown very recently some physical tests of a number of bars of cast iron made by a company producing both pig iron and iron castings by this process. The bars were 1 x 1 in. and several had been tested at Columbia University. The average results showed a tensile strength of about 45,000 lb. per sq. in. with rupture at about 72,000 lb. per sq. in.—exceeding by at least 100 per cent the values of ordinary cupola gray iron castings. Mr. Cone asked Mr. Turnbull what had been his experience along this line and also whether he had made any better record than 700 kw-hr. per ton on the electric consumption, for he had been told that it was possible to produce iron by this process with a consumption of 300 to 500 kw-hr., doubting, however, the former figure.

Mr. Turnbull, in his reply, stated that steelmakers using his iron had found no difference in the quality of steel produced in the open-hearth and that he had no record of tests of the iron itself as cast. It was a fact, however, that the pigs were much tougher than ordinary low phosphorus iron and harder to break, rendering it necessary to be careful in making the pig beds and the connections between each pig. As to current consumption, his measurements recorded in the paper covered a period and were taken on the peak. He believed it possible, however, to make iron on a consumption of 500 kw-hr. per ton on integrated power.

In further reference to Doctor Mathews' remarks, Mr. Turnbull said that Canadian steelmakers were also very reluctant to change their acid to basic open-hearth bottoms as a solution to the problem of scarcity of pig iron. This would involve great expense and loss in time.

The Combined Carbon and Electrode Consumption

Asked by Mr. Cone as to the content of combined carbon in his product, the author said that it averaged about 1.60 per cent when the total carbon was 2.70 per cent, leaving only 1.10 per cent carbon present as graphite. In response to a question from F. A. J. Fitzgerald, Fitzgerald Laboratories, Niagara Falls, N. Y., as to electrode consumption in this process, Mr. Turnbull stated that it averaged 45 to 46 lb. per ton of iron produced. H. E. Randall, the Shawinigan Water & Power Co., Montreal, Canada, said that he knew of one plant that had been started for making cast iron by this process so as to get a quick return on the money.

Corrosion and Copper Bearing Steel

Nearly every meeting of the society is featured by a discussion in some form or another of the corrosion problem. The subject was presented by papers touching on several phases of the question: The corrosion of

steel by the atmosphere, the corrosion of metals by acids and corrosion due to certain conditions in electrolytic pickling or plating.

The familiar topic of copper bearing steel and the corrosion problem was brought out by a paper by O. W. Storey of the C. F. Burgess Laboratories, Madison, Wis., entitled "The Corrosion of Fence Wire." Attracted by the fact that much of the barb fence wire in certain Western districts, made years ago, is still in good condition, while wire now made corrodes or wastes away rapidly, Mr. Storey started an investigation as to the cause. Much to his surprise the author found that, in fences where one strand had corroded and the one alongside it had not, the analysis revealed in the latter the presence of copper. He exhibited specimens. The paper will be reviewed later by THE IRON AGE, but a brief abstract is to the effect that:

It has been definitely established that the durability of old steel fence wire is due to the presence of copper.

Manganese does not increase the corrosion of steel and its absence does not decrease the corrosion.

The copper in the early steel and wrought irons came from the copper-bearing ores of the eastern United States and imported ores. The proportion of copper steel made decreased with the increasing importance of the copper free Lake Superior ores.

Steel fence wire containing copper is as durable as wrought iron.

Present day steel fence wire usually does not contain copper, and therefore corrodes rapidly.

Under ordinary atmospheric conditions zinc corrodes more slowly under conditions favoring rapid corrosion of iron, and vice versa, iron corrodes more slowly under conditions favoring rapid corrosion of zinc.

The life of fence wire is dependent upon the quality of both the galvanizing and iron or steel base. Since the galvanizing is usually thin, the life of the fence depends principally upon the iron or steel base, which should be highly resistant to corrosion.

F. N. Speller, metallurgical engineer, National Tube Co., advised caution in drawing conclusions regarding this complex problem. He recognized the value of copper in steel as a resistor of atmospheric corrosion, but in water pipe a different condition obtains. In the inside of such steel pipe, after two or three years' service, no matter what the copper content, detrimental corrosion always results, but on the outside the copper bearing metal always presented a better appearance than other steels. The outside is subjected to atmospheric corrosion, while on the inside there is a large volume of water.

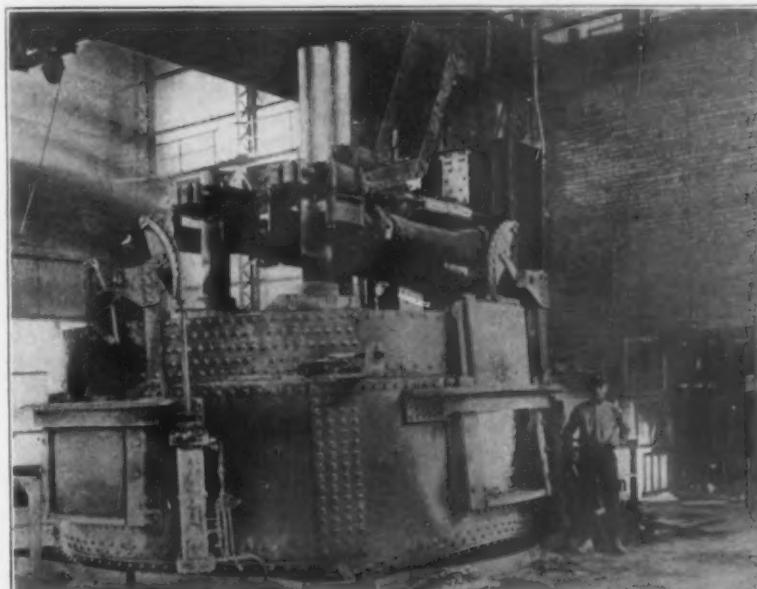
James Aston, Pittsburgh, claimed that the paper points to the complexity of the whole problem, and advised caution as to jumping to conclusions. He reviewed the fact that we have three so-called anti-corrosion materials: wrought iron, in which he believed the slag plays an important part; ingot iron, with its purity, and the copper bearing steels. Unfortunately, he said, Mr. Storey does not tell us the value of pure iron in such fence wire, though he does say that wrought iron containing no copper had a measure of protection. One cannot say in his opinion that any one of the three solutions to the corrosion problem is correct.

D. M. Buck, metallurgist, American Sheet & Tin Plate Co., Pittsburgh, said that Mr. Storey does not

say that copper is a panacea. The results of the author having been called to his attention, he went to Wisconsin and obtained samples of the old barb wire which he analyzed with the same results. He exhibited an array of these samples. He called attention to the fact that sheet steels all corrode in the first 10 to 12 months, but that the copper-bearing ones in all cases slow up at this point, being covered with an apparently vitreous, dense protective coating, while all others continue to waste away.

Dr. Finck said that he had had samples of copper steel sheets that had stood many corroding atmospheres except those at the sea coast, where the salt-laden atmosphere had been deleterious. Mr. Buck reiterated his old contention that his own observations were to the effect that in a salt brine solution all such sheets corroded, while in the atmosphere of the sea coast the copper-bearing metal stood up.

Prof. Joseph W. Richards, Lehigh University, South Bethlehem, Pa., and secretary of the society, called attention to the fact that in barb wire there existed the possibility of electrolysis between adjoining wires in the twisted strands; that this was especially possible if one wire was harder than another. The question is, would straight wire corrode at the same rate?



The Largest Electric Steel Furnace Operating in the World. It is a 20-ton Heroult furnace from which as high as 27 to 30 tons has been tapped. A party of over 200 electrochemists witnessed the pouring of a heat from this furnace on Saturday at the Duquesne plant of the Carnegie Steel Co.

amples of spring steel wire were pickled chemically by simple dipping in acid, also by electrolytic pickling, using them as cathodes or as anodes. Oscillation tests on the original wires, the same sand-blasted, and the three sets treated as described, showed the chemically cleaned and the cathodically cleaned to be very brittle, while the anodically cleaned had the strength of the original samples. Similar tests were also made with drill-rod steel, hot-rolled Bessemer, and cold-rolled steel, after which mechanical tests were made as to strength, elongation and reduction of area. The chemically and the cathodically cleaned specimens again showed greater brittleness, which was most marked with the high-carbon steels and less marked with the soft steel.

Dr. Carl Hering, consulting electrical engineer, Philadelphia, in opening a brief discussion, said that he regarded the results offered by Mr. Coulson as doing an injustice to cathodic pickling. It might be bad for hard steel, but he deemed it beneficial for other steels and not fair to condemn cathodic pickling because of unfavorable conclusions from using hard steel.

Dr. Joseph W. Richards called the generalizations from the experiments altogether too broad, mentioned the fact that only carbon steels were tested, and recommended that the title be modified accordingly.

Another paper along similar lines was "The Prevention of Brittleness in Electroplated Steel Springs." It was presented in abstract by the author, T. S. Fuller, research laboratory, General Electric Co., Schenec-

Pickling Steel and Its Problems

Problems connected with the pickling of steel were given some attention. The subject was brought up by a paper, "Electrolytic Pickling Process and Its Effect on the Physical Properties of Metals," by J. Coulson, physical chemist, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. It was presented by the author. A brief abstract of the paper is as follows:

To determine the embrittling effect of absorbed hydrogen upon steel pickled in different ways, sam-

tady, N. Y. The paper may be outlined as follows:

The literature of the relations of hydrogen to iron, causing brittleness, is extensively reviewed. In the author's experimental work he tested the breaking strength of seven untreated springs, then tested similar ones electrically copper plated, pickled in sulphuric acid and tinned by dipping in molten tin and then copper plated. The pickling makes them brittle, also copper plating, but tin dipping before copper plating is found to prevent embrittlement entirely.

The facts are all in accord with the assumption that the absorption by the steel of atomic or nascent hydrogen liberated at the cathode is the cause of the embrittlement of steel springs in the plating bath.

This embrittlement may be prevented by first dipping the springs in a bath of molten tin. The tin forms a coating on the steel which is impermeable to atomic hydrogen. Rosin may be used as a flux in the tin dipping. The springs may be sand-blasted, but must not be pickled in acid.

Steel springs may be dipped in molten tin at a temperature of 260 to 300 deg. C. without appreciably changing their mechanical properties.

Comment on the author's results was to the effect that the brittleness described was due to the solution and its character rather than to any other cause, and it was suggested that free cyanide might have been present.

Electric Melting of Brass

Two interesting papers were offered relating to brass and copper. T. F. Baily, president Electric Furnace Co. of America, Cleveland, presented an abstract of his paper, "Resistance Type Furnace for Melting Brass." The author gives more recent results of the commercial operation of his furnace which was described in THE IRON AGE, Feb. 1, 1917. He gives running tests of this furnace melting brass and bronze with mechanical tests of the cartridge brass produced and numerous analyses showing the uniformity of the metal at the beginning and end of the cast. The electrical power required shows favorable comparison, he claims, with melting costs when using crucible or open-flame melting furnaces, the average being 450 kw-hr. per net ton of bearing bronze (495 per metric ton), and 311 kw-hr. per net ton of cartridge brass (342 per metric ton).

H. W. Gillett, U. S. Bureau of Mines, in discussing the paper, claimed that Mr. Baily thinks always in terms of 24-hr. operation and both overestimates and underestimates his results. His averages need further explanation, he thought. Table 1 of the paper does not show that the furnace was kept hot at night. The speaker was glad to see the relation in this table between the percentage of loss by chemical analysis and that by weight. Mr. Baily in explanation stated that for continuous operation the current consumption would be about 400 kw-hr., but on 10-hr. operation, about 550 kw-hr.

Deoxidation of Copper for Castings

"Copper Castings for Electrical Use," by G. F. Comstock, metallgraphist, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., was abstracted by Professor Richards. This was the only paper of the 26 on the program not preprinted. In brief, Mr. Comstock recalled the fact that sound copper castings are hard to obtain and that the problem of superior deoxidation was now a subject of experiment at his company's plant. He had found silicon a good deoxidizer if used in the presence of careful melting, and his company had been able to make good sound castings poured in sand. The metal, however, is soft and weak and not easy to harden.

Professor Richards, by way of comment, said that the use of silicon as a deoxidizer of copper was not new and that unless the author had some new way of using it, the paper did not present any additional light on the subject. A member of the society testified that the use of boron, in his experience, makes the conductivity better, the boron being used as a suboxide and also as boron carbide successfully. Testimony was also offered to the effect that two-tenths to three-tenths of 1 per cent of magnesium as a deoxidizer gave good results.

Resistance Furnace for Heating Steel

A resistance furnace for heating steel to forging temperatures was discussed in a paper, "A Resistance Furnace," by Frank Thornton, Jr. Other applications of such a furnace include the heat treating of steel parts; hardening dies and tools, tempering dies and tools; annealing steel, brass, copper and other metals; heating copper, brass and other metals for rolling; melting copper and brass; firing ceramics and firing enameled ware. The paper discusses the heating of furnaces by resistors placed inside the furnace, either on the hearth of the furnace or on a shelf around the walls. The scope of operations suitable to such furnaces is mentioned and the nature of the resistor material, its purity and its electrical characteristics are discussed at length. Experiments were made to determine the suitability of various materials, and best results were obtained with silicon carbide blocks, bricks or rods. Satisfactory running with temperatures up to 1200 deg. C. was obtained.

New Metal for Thermocouples

A paper of interest to those connected with heat-treating problems was "Calorized Iron as an Element for Thermocouples," by O. L. Kowalke, professor of chemical engineering, University of Wisconsin. The author compares the thermo-electromotive force of couples of "calorized" iron-constantan with that of "uncalorized" iron-constantan. A sample of calorized iron wire from the General Electric Co. gave the same thermo-electric potentials as uncalorized iron, up to 1000 deg. C., on repeated calibrations. A sample from the Brown Instrument Co. gave slightly different potentials until after it had been heat treated at 800 deg. C., after which it gave similar results to the other calorized wire. The author concludes that a heavy wire, lightly calorized, gives as constant results as uncalorized iron, and has a much longer life.

Dr. C. G. Finck, in discussing the paper, called attention to the fact that the author presents a cheap thermocouple that is reliable and easily replaced. W. E. Ruder, research department General Electric Co., Schenectady, N. Y., felt indebted to the author for his results.

New Way to Analyze High-Grade Ferrosilicon

Two papers of direct bearing on chemical analytical problems were presented. One was: "A Method for the Commercial Analysis of Ferrosilicon," by Russell E. Lowe, chemist, the FitzGerald Laboratories, Niagara Falls, N. Y. It is recognized that the analysis of high-grade ferrosilicon presents many difficulties and some of these are cleared up by the author. An abstract is as follows:

The method of procedure described involves the decomposition of the alloy by means of nitric and hydrofluoric acids, and the determination of those elements that are generally called for in specifications for the 50 per cent alloy; namely, manganese, sulphur, phosphorus, iron, aluminum and silicon.

In the sulphur and phosphorus determination a method is presented for the necessary removal of the last traces of fluorine without the use of sulphuric acid.

The method, as given, has all of the accuracy of the older fusion methods while at the same time it is more rapid, easier to handle and saves platinum.

Some remarks are appended upon the probable volatilization of phosphorus from samples of ferrosilicon kept nearly 10 years in screw-topped glass jars.

T. D. Yensen, in calling attention to the fact that carbon was not mentioned, asked the author whether it is possible to determine carbon in ferrosilicon without burning the silicon; direct combustion does not get all the carbon. Mr. Lowe replied that the maximum carbon in 50 per cent ferrosilicon was 0.20 per cent and that he had found it impossible to get the carbon by direct ignition. Mixing the alloy with red lead was possible but disagreeable and not very accurate.

"An Improved Electro-Analysis Apparatus" was explained by J. L. Jones, metallurgist Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., the apparatus itself being exhibited and operated. It is a 6- and 10-unit electrically-stirred electrolytic apparatus

for quantitative chemical analyses, particularly in non-ferrous alloys. The electrodes and beakers are fixed and stirring is done by revolving tungsten rods. Each analysis receives its own current, graded by a rheostat from 0.5 to 6 amperes. The volume of non-ferrous work in many large laboratories is now so great that this special type, used by the Westinghouse company, seems to fill the need adequately.

Electric Status of the Norwegian Iron Industry

The Norwegian iron industry was authoritatively reviewed, especially from the electric standpoint, by Haakon Styri, metallurgist Hussey-Binns Steel Co., Charleroi, Pa., in a paper, "The Electric Furnace in the Development of the Norwegian Iron Industry." This development is briefly reviewed, followed by a detailed account of the introduction of electric steel furnaces and electric pig-iron furnaces. The effect of present abnormal war conditions on the expansion and future of the industry is discussed and the commercial relations regarding supply of ore, fuel and steel scrap are elaborated. The development of casting, rolling, and other manufacturing plants is outlined; also the conditions controlling the present investment of capital in these industries. Regret is expressed that the government is favoring non-electric plants, while private capital is more inclined to the development of electric methods. More extended attention will be given to this in a later issue.

The Society and the Naval Consulting Board

The society's share in the work of the Naval Consulting Board was reported upon by two members who have given most of their time the past summer to this important field. Lawrence Addicks, consulting engineer, New York, has been the board's chairman of the committee on special problems in connection with the submarine board. Prof. Joseph W. Richards' duties have been concerned with dealing with all manner of suggestions offered the board from every quarter. It was impossible for obvious reasons to go into details, but it was emphasized that every suggestion and problem, whether apparently of weight or not, was given due consideration and some of the results arrived at had been of deep significance.

The society's board of directors reported a recommendation that the next meeting be held in the South. It also announced that \$2,000 had been appropriated for purchasing Liberty bonds.

A member of the society who has attended all of the 32 meetings since the founding in 1902 said that this one excelled every other in point of entertainment and perfection of management, especially as to plant visitations, which were a feature. Thursday afternoon at least 200 members and guests boarded a special train and were taken to the American Zinc & Chemical Co.'s plant at Langeloth, Pa., where the manufacture of zinc and sulphuric acid was inspected. The research laboratory of the American Sheet & Tin Plate Co. at Pittsburgh and the new laboratory of the Youngstown Sheet & Tube Co. were also visited.

The World's Largest Electric Steel Furnace

The excursion, which wound up the convention, was on Saturday, when a special train took over 200 to the plants of the Westinghouse Electric & Mfg. Co., the National Tube Co. at McKeesport and the steel department of the Carnegie Steel Co. at Duquesne. Here the largest electric furnace in the United States was seen in operation. A heat of 25 tons was tapped for the benefit of the visitors, while at the same time a 75-ton basic open-hearth was also poured. The electric furnace is of the Heroult type and has a capacity of 20 tons, but has made as high as 25 to 30 tons. It began operating in November, 1916. It requires 175 kw-hr. per ton of steel and operates basic on hot metal. There are three electrodes of 12-in. graphite and the electrode consumption is now from 3 to 4 lb. per ton of steel. The current is 3-phase received at 6600 volts and is transformed to 100 volts at the furnace. Six heats are made per day of 24 hr. and each heat averages about 2½ hr. The steel produced by this furnace is used principally for small gun forgings required by the

United States Government, also for ball races, steel balls, etc. The furnace is a tilting one and the ease of its operation was striking.

At the National Tube Co.'s plant, pig iron and Bessemer steel were being made and the visitors were also shown the production of all sizes of lap and butt-weld pipe up to 36 in., made in a building covering 32 acres, said to be the largest in the world under one roof.

Six-Spindle Head for Drilling Machines

The Covington Multiple Drill Co., 2449 West McMicken Avenue, Cincinnati, has perfected a multiple-spindle drilling head equipped with six spindles. It may, however, be used with any number of spindles from two to six, the spindle units being readily attached or removed to suit the work in hand. The spindles are also individually adjustable throughout, having a wide range, and when set they are said to be absolutely rigid. The attachments can be made very quickly, as only one conveniently located locking nut is used for each spindle. It was the aim of the manufacturer to produce a machine of minimum weight and maximum strength, and to carry out this idea steel castings are used for all parts subjected to any strains.

This attachment is known as the No. 3 multiple drill head and is especially made for back-gearaged drilling machines from 22 in. up. Spur gear drive is employed by which, it is pointed out, the flexibility of universal



From Two to Six Holes Can Be Drilled at One Time with a Spur Gear Driven Head for Drilling Machines

joints is obtained without attendant sacrifices to strength and excessive length of the spindle. The spindles are also adjustable vertically to accommodate drills of various lengths. The drive is through a double-ended key inserted in a tang slot of the spindle, which method affords a powerful balanced drive and also makes the attachment a very compact one. The overhang of the auxiliary spindle is only 7 in. below the end of the main one. This allows ample room for handling work of unusual height on the table of the drilling machine. All spindles are provided with ball thrust bearings to take up the end thrust.

Following extensive development and prospecting, the Wharton Steel Co., Wharton, N. J., has uncovered a large vein of fine quality iron ore in the Scrub Oaks property. The vein is about 12 ft. thick and extends for several miles. The company is planning to mine the ore, following the early installation of the necessary equipment. The limestone quarries of the Franklin Lime Co., Hamburg, have been leased by the company, which plans to install new machinery to cost about \$50,000 for increased operations.

Alternating Stress Experiments on Steel

Unique British Machine Built Especially for the Purpose—Results of Tests on Very Mild Steel

A PAPER dealing exhaustively with the subject, "Alternating Stress Experiments on Steel," was recently presented before the Institution of Mechanical Engineers (British) by Dr. William Mason of the University of Liverpool. It has been abstracted by the *Engineer*, London, and part of it is reproduced as follows.

The author began with a description of a machine especially built for the purpose. The specimens are held by square ends in chucks which are supported by gimbals. They may be subjected to torsion or bending stresses or both. For the former aluminum levers are attached rigidly to the chucks. One lever is coupled to the mechanism of the machine and receives a slow reciprocating motion tending to rotate the specimen on an axial line. The end of the other lever rests between the ends of two helical springs which resist movement. These springs press against a fixed block of exactly the same width as the head of the lever, and not till the whole initial compression in them has been balanced by the torque does further compression, with movement of the lever end, begin.

Bending is effected by axial extended levers projecting from the chucks; "the bending movement given by them to the specimen is regulated by control springs in a manner similar to that already described for the torque."

In conducting a test the control springs are screwed up by a calibrated amount to give the required torque, and the amplitude of the twisting or bending lever is regulated until the end of the measuring lever, attached to the other end of the specimen, just takes up the initial load on the springs and no more. This adjustment is effected by observation of the line of light between the ends of the springs and the fixed block referred to above. According to the author it is not of importance that the movement should be measured with much accuracy, and at a very slow speed it is allowed to vary slightly in order to avoid the inconvenience of frequent readjustment. The springs, it may be mentioned, have a stiffness of 11 lb. per inch compression, and hence a movement of one-hundredth of an inch more or less is of little consequence.

The effect of the inertia of the measuring lever, made of aluminum, has been carefully estimated for a change of speed from 2 to 200 cycles per minute, and has been found to be only a little over 1 per cent when the torque is 140 in.-lb., and the lift 0.005 in. It is improbable that under any circumstances the error exceeded this amount.

What has been said of the accuracy of measurement of torque applies to the bending tests. The friction in the only joint that mattered, a ball bearing, is so small as to be negligible.

Apparatus for Measurement of Strains

Torsional strains are measured by an arrangement of mirrors fixed to the specimen by bolts passing through the holes in the square ends. The specimen is held horizontally in the machine. A mirror Q_1 , whose plane is vertical, is secured to one end of the test-piece, as shown by the illustration; a second vertical mirror Q_2 is carried by an arm T , which is bolted to the other end. Q_1 and Q_2 face each other, and are about 2 cm. apart. Both are parallel to the axis of the test-piece. R is a fixed mirror which is merely used for convenience of keeping the telescope and scale on the same side of the machine. The scale is 155 cm. from Q_1 . As the specimen is twisted, the mirrors Q_1 and Q_2 alter their relative inclination; and the range of travel of the point P on the scale is proportional to the total angle of twist during a cycle of stress. A similar arrangement is used for bending deflection.

The material of the tests was provided by the Com-

plex Stress Distribution Committee of Section G of the British Association. It is a dead mild steel of 0.12 per cent carbon. The bars furnished to the author were 15/16 in. square. A direct tension test on a specimen turned to 0.623 in. diameter for a gage length of 4 in. gave a yield point 14.6 tons per sq. in., a maximum stress = $\left(\frac{\text{maximum load}}{\text{area of bar}}\right)$ of 23.5 tons per sq. in., and an elongation of 35.5 per cent in 4 in. The torsion test on a solid bar turned to 0.372 in. diameter gave a yield-point of 9.90 tons per sq. in. shear stress.

The behavior of the material under repetitions of cycles of torsion of equal maximum torque in either direction of twist may be explained as follows: The specimen was given a number of cycles at each of a series of low ranges of stress. Its elasticity was, so far as could be observed by the apparatus for strain measurement, sensibly perfect until the range of stress was ± 5.50 tons per sq. in. At this stress the width of hysteresis loop and the range of twist showed slight increases; and at ± 5.62 tons per sq. in. (calculated from the torque by the formula which assumes perfect elasticity) it was evident that an elastic limit for cyclic applications of this stress had been passed. The range of torque was then increased to give ± 6.25 tons per sq. in. "calculated" (as above) stress; the range of twist now became greater very rapidly. After about 1½ million cycles at this range of torque the range of twist had appeared to attain a maximum value, and after a total of about 2½ millions at this range of torque the piece cracked. These cycles at ± 6.25 tons per sq. in. were imposed at the speed of 200 per minute and without stop or interruption of any kind.

Conclusions

Mild steel will endure a very large number of repetitions of a range stress—considerably greater than the range at which the extra-elastic strain appears—that induces a considerable range of extra-elastic strain. The range of stress (calculated on the assumption of uniformly varying stress) which induces fracture is greater for solid than for hollow test specimens.

The effect of giving rest to a specimen in which an extra-elastic range of strain has developed is to reduce the range of the strain. The physical effect of the rest appears to be similar to that of hardening after strain, and not to be of the nature of recovery of elasticity. The author has not observed in these experiments (with equal + and — stresses) any real adjustment of elastic limits to range of stress.

There appears to be a marked variation, with frequency of repetition of cycle, of the physical state of mild steel subjected to repetition of a higher range of stress than that consistent with unimpaired elasticity, the mobility being greater than with higher frequency.

For the dead mild steel used in this work the range of the induced maximum shear stress at which the elasticity becomes impaired is sensibly the same in both alternating torsion and alternating bending.

The cost of the machine and apparatus used in the experiments has been defrayed by grants from the Royal Society, the Institution of Mechanical Engineers and the University of Liverpool.

Discussion

Several physicists and scientists discussed the paper. As reproduced by *Engineering* they were of the following nature:

R. G. Batson congratulated Dr. Mason on overcoming the many difficulties incidental to the construction of a machine to test material under combined alternating bending and torsion. Dr. Mason had followed, more or less, on the lines upon which Mr. Bairstow,

of the National Physical Laboratory, had worked in his researches in the cyclical variations of stress in iron and steel. The investigation had not afforded a rapid method of determining the limiting range of stresses in a material, but it was very satisfactory to learn that Dr. Mason had found Guest's law to hold good for alternate bending and torsion. In published results obtained at the National Physical Laboratory by the use of a method (suggested by Mr. Bairstow) differing entirely from that employed by Dr. Mason, Dr. Mason's conclusions, particularly in regard to Guest's law, were confirmed.

C. H. Wingfield said it might be of interest to illustrate, by mechanical analogy, the fact that the strain becomes less with rapid alternations. Such an analogy would not, of course, represent all the facts; it represented only certain stresses. He would suppose the plasticity of the specimen under test to be represented by the motion of a plunger in a cataract cylinder. The cataract cylinder is assumed to be full of oil and its two ends are connected by a by-pass pipe provided with a tap. The piston is connected by a rod to a lever mounted on one end of a short shaft which is to be regarded as the specimen under test, the other end of the specimen having mounted on it another lever which projects downward, its lower end engaging with a spring device which can be pulled backward and forward.

When this latter device is moved slowly, the tap on the cataract cylinder being partially closed so as to oppose resistance to the movement of the piston, the arrangement is representative of the application of a torsional stress on the specimen, and the piston will move a certain distance representing the amount of strain. If the speed of movement of the spring device to and fro be increased there will not be time for so much of the oil to be transferred from one end of the cylinder to the other during each application of stress, and the movement of the piston will therefore be less, thus indicating a less amount of strain. Increasing the speed still further, the angle through which the levers pass would be again diminished, reducing the amount of strain indicated, exactly as the author had found in the case of his experiments.

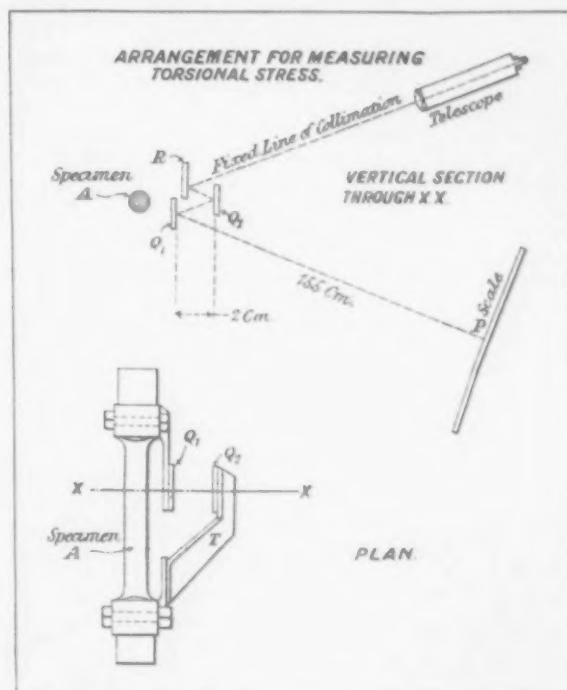
The mechanical analogy failed, however, in not showing why the range diminished with a constant amount of stress. The well-known reciprocating test machine by Captain Sankey—one which acted by slow motion—showed distinctly that a specimen when twisted backward and forward hardened, as the author had expressed it, and became stiffer and more difficult to twist. That was an everyday experience, as evidenced by the fact that a bit of copper, when twisted backward and forward, would become stiff. In the same way it would move a less distance to give the same compression in the spring.

Nature of the Steel Used

Dr. F. Rogers, of Sheffield, regarded as important the fact that Dr. Mason had dealt with both the plastic and elastic ranges of steel. At the same time, all were fairly convinced that in the elastic range of stress there was also a hysteresis loop, an elastic, or recoverable strain. One thing was clear from Dr. Mason's work and that of others, that as research proceeded the stress at which plastic deformation began to show was lower and lower every year. Methods of discovery had become finer, and he thought everyone would agree that Mr. Mason had made a great effort, in his mechanism, to meet all the refinements which, at the present time, could possibly be foreseen, so as to get his stresses well under control and his means of measuring the strains accurate.

In this connection he would refer to the author's remark that mild steel would endure a very large number of repetitions of a range stress—considerably greater than the range at which the extra-elastic strain appeared—that induced a considerable range of extra-elastic strain. That would be so if the steel were a good one. The steel subjected to experiment was a very mild steel, very low in carbon, lower, in fact, than was nowadays commonly used except for a very few special purposes. The speaker was, incidentally, inter-

ested in the steel because it was one of the British Association steels which he had been instrumental in obtaining for his own committee. The result of a tensile test of the material, quoted in the paper also established



Plan and Section of Mirror Attachments for Determining Alternating Stresses.

the fact that the steel must have been of good, tough and mild quality. He would like, finally, to emphasize his opinion that the machine used was the right one for the work.

Reply by the Author

Dr. Mason in replying to the discussion said that Mr. Wingfield's mechanical analogy, while a good illustration, broke down at the point perceived by that gentleman, it could not be carried further, and was only exact for the effect of variation of speed; it did not account for the contraction by strain at constant speed. He had understood Dr. Rogers to say that the range of stress at which the specimen broke was, with the progress of time, getting smaller and smaller, owing to the greater delicacy of the apparatus used and the greater prolongation of the tests. The speaker's personal experience, however, reversed that conclusion. With a thousand million repetitions of stress, less than 5.5 tons per sq. in. in torsion, there would be no change in the steel; it would be the same at the end as at the beginning.

Conservation of German Structural Steel

In the interests of national defense instructions have been issued by the German Minister of Public Works to limit the use of iron and steel to the lowest possible minimum and to substitute other materials in building construction where possible. The circular states that there is no objection to exceeding within certain bounds the limits of the maximum working stress which are imposed by the regulations in force in Germany, so far as they apply exclusively to war constructions designated as such by the Minister of War. The limits may be extended to 1200 kg. per sq. cm. and even 1500 kg. per sq. cm., but they should never exceed 1600 kg. The other official regulations will remain in force, and it is understood that the calculations of stability must be rigorously exact and the pieces of iron and steel will be reduced to the minimum dimensions.

A record was made in connection with the relining of the No. 2 furnace of the Minnesota Steel Co. at Duluth, Minn. The furnace blew out on Sept. 7 and was blown in on Sept. 22, the interval being but 15 days.

FOUNDRY EXHIBIT AT BOSTON

Machinery and Iron, Metal and Melting Equipment Exhibits at the Recent Exposition

Supplementing the detailed analysis of the exhibits of equipment for the foundry industry shown at the foundry and machine exhibition in Boston in the week of Sept. 24, in connection with the annual meetings of the American Foundrymen's Association and the American Institute of Metals, may be appended the following statement of exhibits for which space could not be provided in the issue of Oct. 4. In that issue were covered the exhibits of molding machines, sand blasting apparatus, core ovens and binders, sand handling equipment, conveying equipment and general foundry equipment and supplies. Following is the supplementary account:

Machinery and Tools

The display of machine tools, small tools, vises, saws and special machinery was large, but only a few of the products displayed were absolutely new. One entire hall was filled with machinery, much of it in operation, and in all of the other halls were to be found machine and tool exhibits. With a few exceptions the products shown agreed with the preliminary announcements published in THE IRON AGE, Sept. 20.

The Simonds Mfg. Co., Fitchburg, Mass., had in operation on a Nutter & Barnes machine a new thin metal-cutting saw which had high-speed teeth inserted in a carbon steel body. This saw cuts a kerf no wider than a solid blade saw. E. C. Atkins & Co., Indianapolis, showed a new adjustable hack saw frame with a hard rubber pistol grip handle and the wing nut under the handle out of the way but easily accessible.

The McCroskey Reamer Co., Meadville, Pa., showed two new reamers and a new turret tool holder. Its super adjustable high-speed reamer has as its feature the forward adjustment of the blades so that a considerable length of blade is available for grinding, which can be done without cutting into the body. A smaller reamer than has formerly been available is found in the Norton inserted blade adjustable reamer in which the blades are inserted on a spiral and adjusted forward.

The Rivett Lathe & Grinder Co., Boston, showed a new fully automatic radial grinding machine and the Oliver Machinery Co., Grand Rapids, Mich., a 16-in. tool room engine lathe with taper, relieving and draw-in collet attachments and a follow rest. A new machine in the large exhibit of the Cincinnati Pulley Machinery Co., Cincinnati, was a $\frac{3}{8}$ -in. drilling machine with a built-in tapping attachment, so designed that the tapping attachment can be thrown out, making it a plain drilling machine. A new design of tool room drill press was also shown with both swinging and revolving tables. A motor-driven bench planer with some unusual safety features to replace hand planing in the pattern shop was shown by J. D. Wallace & Co., Chicago.

In air-power machinery there were several fine exhibits. One that attracted much attention was the compressor of the Sullivan Machinery Co., Chicago, which supplied air to many of the operating exhibits. This machine was an angle compound short belt driven air compressor with a new design of end rolling finger plate valves. This machine had a capacity of 445 cu. ft. of free air against a terminal pressure of 100 lb. at a speed of 250 r.p.m. Another machine furnishing air for pneumatic machines and tools in other exhibits was installed by the Chicago Pneumatic Tool Co., Chicago. This was a 511-ft. compound, short belt-driven compressor of a standard type. Yet another compressor in operation was in the exhibit of the Curtis Pneumatic Machinery Co., St. Louis. The General Electric Co. showed two sizes of cupola blowers, motor-driven.

Other machinery exhibits which attracted special attention were those of the Bilton Machine Tool Co., Bridgeport, Conn.; American Pipe Bending Machine Co., Boston; Hill, Clarke & Co., Boston; Warner &

Swasey Co., Cleveland; Beaudry & Co., Boston; Norton Co., Worcester; Dings Magnetic Separator Co., Milwaukee, Wis.; Charles H. Besly & Co., Chicago; Lynd-Farquhar Co., Boston; Gardner Machine Co., Beloit, Wis.; Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.; Forbes & Myers, Worcester, Mass.; Chase Turbine Mfg. Co., Orange, Mass.; Divine Brothers Co., Utica, N. Y., and Athol Machine Co., Athol, Mass., which had a display of vises and machinists' small tools.

Iron, Metal and Melting Equipment Exhibits

As usual, the most attractive exhibits were to be found among the coke, pig iron and non-ferrous metal displays. The Grand Hall was dominated by a most unusual exhibit made by the New England Coal & Coke Co., Boston. This was a replica of Bunker Hill Monument made of foundry coke with four statues at the corners, reproducing the figure of the Puritan which is the company's trademark. The display of Solvay coke made by Pickands, Brown & Co., Chicago, took the form of a giant hub, emphasizing the thought that coke is the hub of the foundry. In the exhibit of Rogers, Brown & Co., Cincinnati, was displayed what is claimed to be the greatest collection of pig iron specimens ever gathered together. Castings had been gathered from all parts of the country and involved molding and pouring problems that made many a foundry superintendent heave a sigh of relief that he had no such difficult pieces to mold. Other attractive booths in the Grand Hall were those of the Thomas Iron Co., Easton, Pa., and the Debevoise-Anderson Co., New York.

Elaborateness marked the several exhibits of non-ferrous metals. The Ajax Metal Co., Philadelphia; the Michigan Smelting & Refining Co., Detroit; White & Brother, Inc., Philadelphia; the Titanium Alloy Mfg. Co., Niagara Falls, N. Y., and S. Birkenstein & Sons, Chicago, had imposing and interesting displays of metals and castings. The General Briquetting Co., New York, and the Eastern Brass & Ingot Co., Waterbury, Conn., demonstrated the progress that has been made in the process of briquetting scrap, turnings and borings. Several crucible displays were made, including an imported crucible made in Japan from Ceylon graphite and foreign clays, shown by General Platers Supply Co., New York.

Cupolas were shown photographically by several makers and there were several exhibits of both crucible and non-crucible types of melting furnaces for non-ferrous metals. A new furnace in the booth of the Monarch Engineering & Mfg. Co., Baltimore, Md., was of 300-lb. capacity, designed to meet the needs of the small consumer. The special feature is a simplified lining.

A new safety feature in connection with cupola practice was exhibited by the Federal Foundry Supply Co., Cleveland. The bottom doors of a cupola are provided with compensating weights so that they can be easily closed. In connection with this method a collapsible cupola bottom bar was shown which, beside the collapsible joint, has a screw extension which makes it unnecessary to shim up the bar. A model of the Ludlum electric furnace, made by the Ludlum Electric Furnace Corporation, New York, with charts of analyses of products and samples of castings made an exhibit that drew favorable attention.

Special Displays

Of exhibits which come under no general classification may be placed the display of the General Fire Extinguisher Co., Providence, R. I., which included a working exhibit of the sprinkler head in operation, a working set of the alarm system employed in connection with the A. D. T. service, and an exhibit of the Rector system of gas heating, including a Hale gas mixer.

The Westinghouse Electric & Mfg. Co., Pittsburgh, showed no products for sale but made a comprehensive display of the many safety features which have been developed in its own plants, freely offering ideas for use of the visiting plant managers.

Structural features for modern foundries were shown by several exhibitors, including the G. Drouve Co., Bridgeport, Conn.; Frank D. Chase, Chicago; David

Lupton's Sons Co., Philadelphia; the Ayer & Lord Tie Co., Chicago, and the Jennison-Wright Co., Toledo.

This long description does not mention many other worthy displays. The only moral that can be drawn is that every live foundryman misses an opportunity to see at first hand the developments of his craft when he misses a foundry convention and its exhibits.

Record Exports of Tin Plates—Production in 1916

The tin plate exports from the United States in the two fiscal years ended June 30, 1917 and 1916, under war conditions, are remarkable, taking into consideration the fact that this product has become a factor in exports only in the last 10 years. The first exports of tin plates were 20,827 lb. in 1898. *Commerce Reports* publishes the following data:

Exports of tin plates, terne plates and taggers' tin reached their highest record in the fiscal year ended June 30, 1917, with a total of 521,861,390 lb., valued at \$28,404,433, against 516,257,473 lb., valued at \$18,703,773, in 1916, and 105,899,762 lb., valued at \$3,643,806 in 1914. While the increase in 1917 over 1916 was only 5,603,917 lb., the increase in value was \$9,700,660.

American tin plate is exported to 75 countries in all parts of the world. Canada, our best customer, took 133 2/3 million pounds in 1917; Argentina, 51 1/3 million pounds; Japan, 46 1/2 million pounds; British India, 39 4/5 million pounds; Dutch East Indies and Brazil, 31 1/5 million pounds each; China, 30 1/2 million pounds; Hongkong, 22 1/2 million pounds; United Kingdom, 19 1/2 million pounds; Italy, 18 3/5 million pounds; Straits Settlements, 12 1/4 million pounds; Uruguay, 11 1/2 million pounds; France, 10 3/5 million pounds; Cuba, 9 million pounds; Mexico, 4 1/3 million pounds, and Russia, 4 1/5 million pounds, with lesser amounts to many other countries. In addition to these large exports to foreign countries, there were shipments to Alaska aggregating 38,828,357 lb., and to Hawaii 17,949,296 lb. There were also shipped to Alaska tin manufacturers, chiefly tin can bodies and tops, valued at \$3,894,165.

The following table shows the imports and exports of tin plates, terne plates and taggers' tin for a series of fiscal years. It is a remarkable fact that the imports of this commodity reached the highest record in the year in which domestic manufacture commenced.

Fiscal Years	Imports, Lb.	Exports, Lb.
1891	1,036,489,074	.....
1892	422,176,202	.....
1899	108,484,826	205,910
1901	117,880,312	1,367,405
1904	126,909,360	8,107,666
1906	120,819,732	25,967,137
1911	95,319,730	70,199,398
1912	6,613,253	181,899,366
1914	48,877,947	105,890,762
1916	1,796,853	516,257,473
1917	1,370,462	521,861,390

The production of domestic tin plate began in 1891, during the last six months of which there was produced 2,236,743 lb. In 1892, the first full calendar year of the industry, the production reached 42,119,192 lb. and in 1916 it was 2,766,401,000 lb. Of the production in 1916, 2,552,224,000 lb. was tin plates and 214,177,000 lb. terne plates.

The German Tin-Plate Industry

Efforts are being made to form a syndicate among the German tin-plate manufacturers. The old tin-plate syndicate was dissolved in 1914, but the manufacturers are said to have now come to the conclusion that an organization cannot be dispensed with. It is thought that a new syndicate will be formed, but not until after the war. A large part of the tin plates used in Germany were formerly imported from England, but it is claimed that the German home industry has now grown so much that it will be able to export large quantities when normal conditions are restored.

Automobile Cylinder Grinding Machine

To provide for the grinding of the cylinders of aircraft, automobile and motorboat engines, the Hy-Grade Machine Co., 5606 Curtis Avenue, Cleveland, has built a vertical type of machine. As provision is made for passing the cylinders under the grinding spindle and also for adjusting the spindle to travel around the bore while it is rotating, it is possible to take care of practically all sizes of cylinders.

The machine consists of three principal parts, the vertical frame and table which are cast in one piece, the sliding plate upon which the cylinders are mounted and a set of supporting legs. The ways on the vertical frame and the bottom surface of the table are machined and finished by scraping. The sliding plate on which the cylinder is mounted operates on adjustable ways and can be traversed the full length of the machine. In this way the different cylinders of the engine can be brought under the grinding spindle. The plate measures 16 x 22 in. and is 2 1/2 in. thick and a working space measuring 18 x 22 in. is provided underneath.

The spindle is mounted in a movable head and can be adjusted to travel around the bore of the cylinder as it rotates upon its own axis. A belt, that extends back through the ways upon which the movable body travels, drives the spindle. A lead screw operated in both directions by bevel gears at the top of the frame raises or lowers the movable head. A rod with adjustable stops governing the clutch between the two bevel gears at the top regulates the feed, while the rotation of the spindle is controlled by a clutch on a spline shaft driven by spur gears at the top of the frame. The feed for the grinding wheel is operated by a worm with a graduated plate. The spindle, which is 16 in. long, is equipped with a double row ball bearing and an adjustable bronze bearing equipped with a retainer to prevent leakage of oil. The spindle body, which has a travel of 22 in. on the vertical ways, is equipped with adjustable bronze bearings.

The operating levers are concentrated at the front of the machine within easy reach of the operator and counterweights are provided, which are relied upon to relieve the working parts from strain and wear. The machine occupies a floor space of 28 x 32 in. and is 6 ft. in height.



Cylinders of Internal Combustion Engines Are Mounted on a Sliding Plate and Successively Brought into Position for Grinding

Burwell S. Cutler Made Chief of Foreign Commerce Bureau

The appointment of Burwell S. Cutler, of Buffalo, as chief of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, was confirmed by the Senate Oct 5. Mr. Cutler, who is well known in manufacturing circles in western New York, went into the bureau six months ago at a nominal salary to assist in putting the organization on a thoroughly business basis. He was made first assistant chief, but since the resignation of Dr. E. E. Pratt, has been acting chief.

Mr. Cutler was born in Buffalo and finished his scholastic education at Lake Forest University and Harvard. For 15 years he has been president of an important Buffalo manufacturing concern and has been identified in an official capacity with numerous business houses and civic organizations throughout New York State.

Economical Production of Small Cores*

Scientific Methods in the Core Room —Lowering Costs and Increasing Production and Accuracy of Cores

— BY R. E. KENNEDY

ALL factors of manufacturing must be governed by ultimate costs and when applied to the core room may be classified as the workers, the materials and the equipment and its arrangement. Standardization, recognized by manufacturers as an

Where cores are necessarily rather weak, longer hauling and repeated handling lead to high loss. 4. Methods of handling. Use of adequate transportation equipment over free gangways or overhead conveyors permits of greater hauling distances with less breakage.

Centralization of coremaking can be taken advantage of when the cores are small and the transportation facilities are good. Confining all the coremaking to one place reduces labor and floor space.

As in other lines of manufacturing the core room has the same degree of adaptability to being laid out for the straight-line flow of material through the department from raw material to the finished product. As indicated in Fig. 1, all work should progress through the following steps, in the order named: Sand storage; batch mixer; storage for batches of various mixes; core bench; oven; pasting, blackening and assembling; re-drying, if necessary, and stock storage.

The most logical way to bring the sand there is to have it shoveled direct from the cars into bins near the core room. If not so located and changes cannot be made, it will have to be handled by cars on an industrial track, by horse and wagon, or by wheelbarrow. The core room then should be given its place close to the railroad siding.

Some foundrymen, realizing the necessity for having sand mixes made as standard as possible, have installed equipment for drying the sand. A sand of absolute uni-

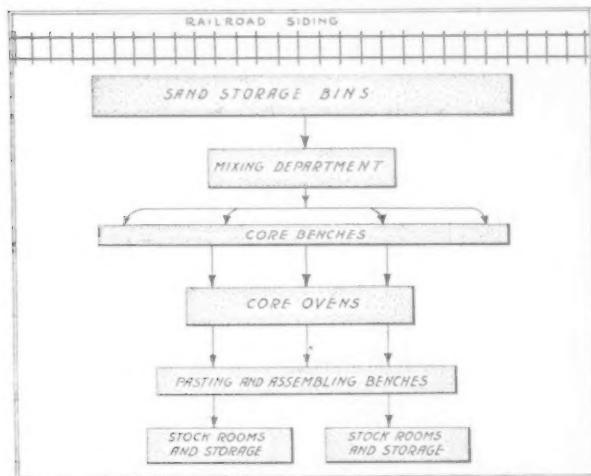


Fig. 1.—In the flow of materials in a core department each step should be considered to establish the work in the most efficient manner.

essential feature of their business, brings good results to the core room. The use of unstandardized materials, methods and equipment in the shape of varying core sands, binders, working of core boxes and use of miscellaneous plates, leads to constant trouble and loss of time. The use of special handling equipment, like the lifting truck and its attendant special and standard platforms, has many opportunities to effect economy in the core room.

Core Room Labor

The problem of labor in the core room is much the same as in other departments of the foundry, as regards the selection and training of workers. The use of women in the core room has proved satisfactory, where conditions of cleanliness, light and ventilation have been given attention. In many cases women have given better results than boys or men, where the work required deftness and quickness. The necessity of providing boys to do the heavy lifting and carrying where women were employed stimulated production, due to the specialization of labor.

Laying Out for Straight-Line Flow

The location of the core room depends on: 1. The size of cores. Large cores demand that the location of the core room be fairly near the point of use of cores in the molds. Small coremaking can be centralized. 2. The number of pounds of cores used per molder has a bearing upon the distance from the core room to the point of molding. 3. Strength of individual cores.

*From a paper read at the annual meeting of the American Foundrymen's Association, Boston, Sept. 27, 1917.

INSTRUCTION CARD		FLOOR	BENCH	MACHINE	STATION 4																																																						
SHOP LABORATORIES FOUNDRY DEPARTMENT																																																											
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Fig. 2—Written instruction cards may be made out for the men doing the mixing. The sand and binders purchased should run true to a standard quality. Then definite routines can be followed and exact amounts of materials used in making up the core sands, which will insure uniform results in cores, both while green and in the dry state.

both white green and in the dry state
formity in moisture content is necessary to begin with,
and when damp sand is used directly in making mix-
tures, this absolute uniformity is not obtained.

Dry sand occupies less space than wet sand. If

10 per cent of water is added to clean lake or silica sand the volume increases 40 per cent. This should be taken into consideration when buying and making up core sand mixtures. When adding binder to sand of varying moisture content the strength of the resulting cores will be different and the number of cores obtained from mixing up a wheelbarrow load of dry sand will be greater than the number obtained when starting with a wheelbarrow of damp sand. With dry sand as a basis, binder and water in exact amounts can be added with every assurance that core sands of the same physical qualities will be turned out, day after day.

Mixing Rooms

The mixing room of the average foundry, if there is one, should be located as directly as possible between the sand storage and core room, with easy passageway for trucks. It is essential that standard measuring instruments either in the shape of cups, boxes, buckets, or barrows and riddling and mixing machines be used. The employment of uncertain and varying sized measures leads both to excessive amounts of binders and to the occasional lack of the full amount needed.

Combined with the use of these exact measurements should go instruction cards, containing the necessary information to obtain exact results, even though different men do the mixing. Such a card is shown in Fig. 2.

The number of cores per day from the coremakers is influenced by the character of the binder, for if it tends to stick to the box the maker cannot turn out as many as where a free working material is used. This sticking to the box is due, in many cases, to too great a percentage of binder and the trouble often can be eliminated by reducing the proportion of binder.

Accurate records should be kept of the costs per ton of mixing the different core sands and binder combinations and when these data have been observed for a while the importance of studying for cheaper combinations will be realized. When the costs of these different mixtures are not known an expensive sand often is used where a cheaper one would produce as good results. Weekly summaries of the cost per ton in labor and materials used in the production of these different grades of sand will produce records for comparison and lead to the cutting down of core room costs.

Economical Use of Mixing Machines

Air and electric riddles and small compounding mills prove of value to the core room having even a small output, for the increased quality of the sand mixtures goes far toward cheaper materials and labor costs. By the use of a compounding mill one foundry was able to reduce its costs as shown in the table below, which gives the results of using a compounding mill where it was desired to use some gangway sand in the mixture instead of all new sand.

Comparative Core Sand Mixture Costs When Using Compounding Mill

Cost When Not Using Mill

40 per cent or 800 lb. of new molding sand at \$1.20 per ton	\$0.48
40 per cent or 800 lb. new sharp sand at \$0.60 per ton	0.24
20 per cent or 400 lb. of old core or gangway sand 1 to 80 per cent	0.75
40 per cent or 50 lb. compound at \$30 per ton	
Total	\$1.47

Cost When Using Mill

20 per cent or 400 lb. of new molding sand at \$1.20 per ton	0.24
80 per cent or 1600 lb. of old core sand 1 to 80 per cent	0.38
or 25 lb. of compound at \$30 per ton	
Total	\$0.62

Having been mixed, the core sand is either taken directly to the core room or shoveled into bins which are temporary storage for the different grades of sand. If such bins are used either they should have sliding or lifting doors at the bottom, where the sand can be

shoveled directly from the floor, or the bins should be left open at the front.

Inefficient handling of raw material and product in-

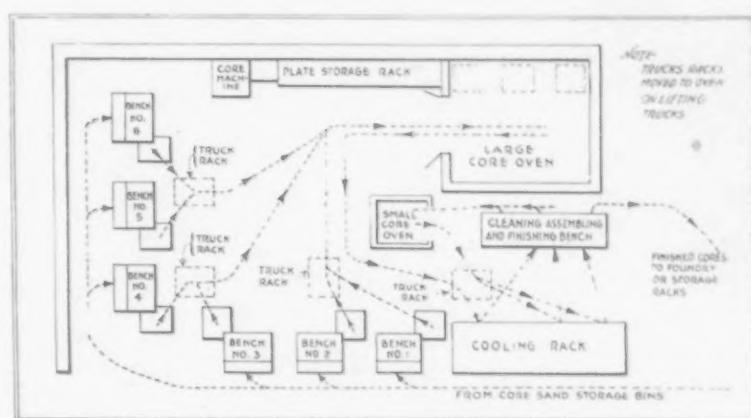


Fig. 4—This plan shows the steps taken to rearrange this core room to give the work a better routing. The crossing and interfering of the work was eliminated by erecting new benches and changing the location of equipment

creases the cost of production. Even in small plants much can be done to systematize the delivery of core sand to the benches and do away with the necessity of skilled workers leaving their benches in order to get sand and do mixing. Crowded gangways, littered with core plates, riddles, boards and other trash, go far toward making for inefficient delivery of materials. Rows of benches ranged back to back with sufficient space for a gangway between them will allow the free passage of laborers with their wheelbarrows of sand, rods, etc., to pass without disturbing the coremakers, or the cores setting on stands by the core benches. Benches with a hopper at the back permit of a larger volume of sand being left on the bench at one time, without its being in the way of the worker or without having him disturbed when it is being delivered to his bench.

Figs. 3 and 4 show how the core room at the University of Illinois was rearranged for the better handling of materials and permitting the flow of work to progress in a systematic manner. The coremakers placed their finished plates of cores on racks adapted to use with an elevating truck. This type of truck furnishes the means for the continuous use of large truck ovens. The use of rack trucks on stationary tracks prevents the oven being used while the cores are being loaded into the rack and when they are being removed. The continuous use of the ovens is an important factor where trucks are the means for holding the cores in the oven. Where ovens have to stand

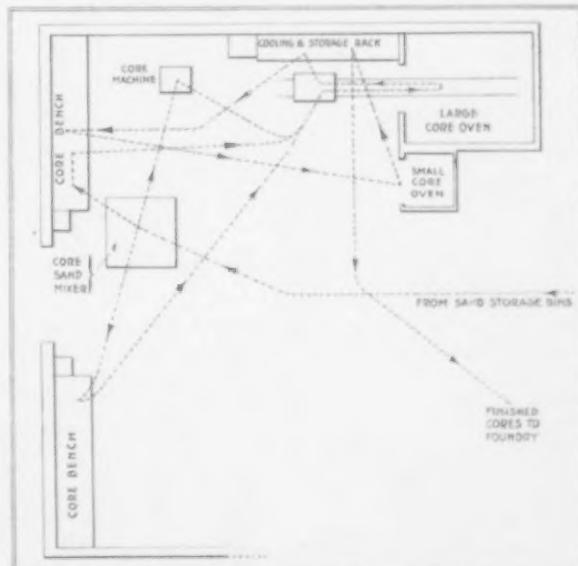


Fig. 3—In this foundry core room the raw and finished product crossed and recrossed several times, delaying the work and causing congestion

October 11, 1917

idle while their truck racks are being loaded and unloaded, just twice as much oven equipment as is required is being used. When using steel racks in connection with these elevating trucks as many racks as

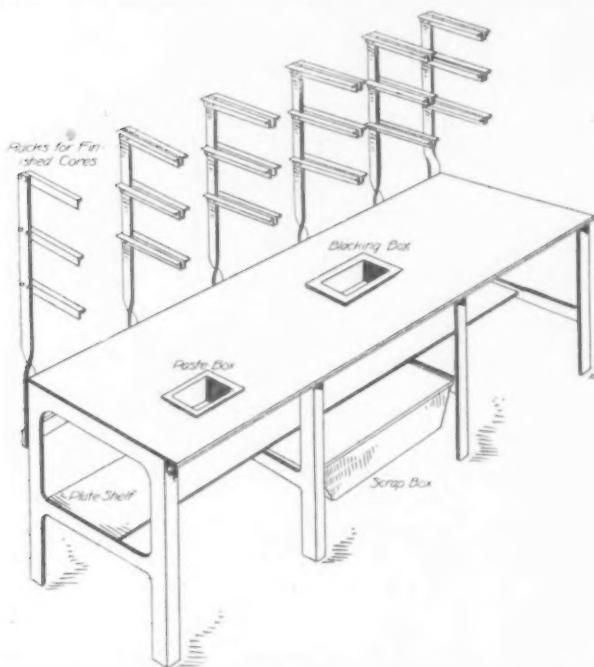


Fig. 5.—In designing this pasting and assembly bench for small cores provision was made to enable the worker to have materials and plates located in the most convenient position possible.

can be utilized are on hand. Some are placed at the core benches and are being loaded, while another set can be in the oven with baking cores, with a third set with baked cores being unloaded at the assembly benches.

Where these racks can be placed back of the coremaker's bench they will produce best results. In a foundry studied by the writer the time wasted by the coremakers when taking each plate to the oven amounted to more than an average of two minutes per plate. This two minutes loss on each plate could have been reduced to a six-minute loss on 40 plates by using the portable rack.

To insure oven work of the highest degree of uniformity, ovens must be so constructed that their temperature can be maintained at a constant point. They must be well insulated and as free from uncontrolled air as possible. Recording thermometers should be installed, and the thermostat used in connection with the oven flues or dampers will assist in the obtaining of an even degree of heat by providing mechanical means of damper control.

In one large core room it was found that the best results from a continuous oven system for certain cores was obtained when a temperature of 525 deg. Fahr. was maintained. For the ovens used for baking cylinder barrel cores a temperature of 500 deg. Fahr. maintained for two and one-half hours gave the best results. A radiator foundry running about 35 tons of core sand a day found out when using recording thermometer control that 380 deg. Fahr. for the first hour followed by two hours of steady heat, then three hours of slow cooling, gave the best results. The varying of the temperature was obtained by using forced draft.

Finishing and Assembling Cores

Where large numbers of cores are being made the work of smoothing, pasting, blackening and assembling cores can best be divided into separate operations so

that special workers each have one or two operations to perform.

If the benches are arranged as in Fig. 5 so that successive operations can be performed by workers sitting next to each other or across the bench from each other, the cores can be passed directly from man to man, eliminating the necessity for storing in trays and carrying or hauling to the next operation. The cores having been finished and assembled, they can best be stored in trays or boxes or on boats, where they can be left until wanted in the foundry and then carried in these same trays direct to the molder's floor, where they are wanted.

Order and Stores Control

The method of core routing and core storage used by the Mueller Mfg. Co., a large manufacturer of brass plumbing goods, uses factory orders, Fig. 6, made out in duplicate, which go to the man in charge of the core-box storage. He gets the desired box from its rack and places it with the order on a rack accessible to the core room foreman. Rush orders and the corresponding boxes are immediately sent to the core room foreman in his office.

Each core has an estimated rate per hour, divided into three classes, *A*, *B* and *C*, according to their intricacy, the most intricate being classed at *A*. The coremakers are rated according to their skill, as *A*, *B* or *C* class, and are paid a corresponding rate per hour, which they get without question, no matter how much they turn out.

If, as shown on the sample card, Fig. 6, the job is scheduled Class *A*, at 35 cores per hour, or 315 for nine hours' work, and the coremaker at the end of the day has produced a total of 350 or 35 above the schedule, she is paid 11 cents extra. This rate of 11 cents is paid for the scheduled number of cores per hour which are turned out in excess of the standard for Class *A*. If the cores are rated in Class *B*, the coremaker is paid 10 cents for each scheduled hour's work in excess of the standard and for cores in Class *C*, 9 cents is paid.

The foreman at the start of work in the morning and afternoon, from his orders, lays out work in advance for the coremakers. The core boxes to be worked are marked with the coremaker's number and sent to a station where a workman gets ready the wires and dryers needed. When the coremaker is ready to start

Core Order					
No. 39119					
DATE STORED	QUANTITY STORED	RACK NO.	SEC. NO.	TRAY NO.	DELIVERED
6/15	125	C	8	435	✓
6/16	50	H	19	122	✓
6/19	307	K	10	310	
6/20	38	B	4	34	✓
THIS CARD INDICATES THAT 528 CORES ON THIS ORDER HAVE BEEN MADE. SHOWS THE LOCATION OF THE FOUR PLATES AND INDICATES THAT PLATE NO. 10 IS STILL IN THE RACK.					
Catalog No. 30065 Size 1/2"					
Wt. of 100 Pcs. 600					
Quantity 600					
Instructions					
INSTRUCTIONS TO COREMAKER WRITTEN IN THIS SPACE					
Schedule -35- PKR HOUR CLASS A					
Coremaker 270 C					
Counted by 201					
Approved by Designed by H. W. Knouse Foreman 601-101-10-8-18 REVERSE					

Fig. 6.—Exact orders to the core room insure the cores being ready for the molder when the foundry is scheduled to start molding. The back of the duplicate order which is retained by the coremaker is used as a memorandum to keep track of the number of cores he has made, while the back of the original copy is used by the clerk as a final record.

on new work, she obtains her duplicate of the work order, obtains her box and wires, while the dryers are carried to her bench.

As she finishes a plate of cores she enters the number made on the back of her core order. Each plate has placed on it an iron tag with the part number corresponding to that on the work order. The green cores are carried to the ovens by a boy. The ovens are charged by a man who regulates the baking and removes the cores to cooling racks. From the cooling racks they are taken to the benches where girls clean and smooth them up with graphite. The finished cores are next taken to the inspecting and checking rack. At this point the inspector notes on the back of the original order the date, the number in the tray, the rack and section number, when it is to be stored until taken to the foundry, and the tray number. The iron tag which has followed this plate of cores through the different operations is removed, and a paper tag is placed with the cores.

When the entire number of cores have been finished for the order this core-order card is placed in a rack where the laborer who takes the cores to the molders has access to it. This man then knows where to obtain the needed cores, and as he removes them to the molding benches he checks off on his work-order card the number of the plate delivered.

This system provides for having the needed cores on hand when wanted and in a known location. It also provides against dispute between the foundry and core room as to cores made and delivered, supplies the information for the payment of bonus to the workers, and checks losses during the progress of cores from the makers to the foundry.

Each person has his or her specified duty and becomes a specialist in that work. The summary of the flow of work is as follows:

1. Order received at box vault.
2. Order and box delivered to foreman.
3. Day's work scheduled by foreman.
4. Wire and dryer man prepares boxes of wires and dryers.
5. Coremaker has sand brought to bench and receives box and dryers.
6. Green cores taken by laborer to oven.
7. Oven-tender bakes and removes cores to cooling rack.
8. Laborer supplies girls who clean and blacken cores.
9. Finished cores inspected and counted.
10. Finished cores stored in racks of numbered sections.
11. Cores removed to foundry from storage rack by special laborer as they are needed by molder.

Iron Ore Shipments in September

Iron ore shipments from the Lake Superior region in September declined slightly, the total being 9,536,152 tons, a decrease of 64,634 tons compared with September, 1916. The movement to Oct. 1 this year shows a decrease of 2,756,944, or 5.64 per cent. The totals by ports are as follows:

	September, 1916	September, 1917	To Oct. 1, 1916	To Oct. 1, 1917
Escanaba	922,517	1,078,531	5,630,994	5,167,722
Marquette	557,140	509,754	3,026,845	2,408,816
Ashland	1,255,328	1,199,297	6,051,712	5,625,209
Superior	1,945,171	2,174,530	9,760,966	10,376,746
Duluth	3,455,611	3,190,347	16,174,159	15,189,368
Two Harbors ...	1,465,019	1,383,693	8,171,974	7,291,845
	9,600,786	9,536,152	48,816,650	46,059,706
1917 decrease .....	.....	64,634	.....	2,756,944

Shipments from Duluth amounted to 33.45 per cent, compared with 35.99 per cent of the total in September, 1916. Shipments from Superior were 22.81 per cent of the total last month, compared with 20.26 per cent in September, 1916.

The National Implement and Vehicle Association, according to the announcement from the office of the secretary and general manager, E. W. McCullough, will hold its annual convention at the Congress Hotel, Chicago, Oct. 17, 18 and 19. The registration is already more than 50 per cent ahead of the largest previous attendance. The interest thus shown is considered to indicate "the confidence of the members in the value of co-operation in meeting unusual conditions and solving the many difficult problems of manufacturing and selling which have confronted every one during the past year."

TRANSCONTINENTAL RATES

Purchase of Steel for Shipbuilding Has Bearing on the Case

WASHINGTON, Oct. 9.—A proposed readjustment of the transcontinental freight rates to meet the situation arising from the water competition through the Panama Canal, which was directed by the Interstate Commerce Commission some time ago, will not be put into effect on Oct. 15 as originally planned. This case arose out of a petition of the railroads to file extra low rates to the Pacific coast on iron and steel, chiefly from Eastern points, without making proportionate reductions to intermediate points. The case had many varying trends due to the effect of the war on water transportation. The final decision of the commission was to refuse permission to the roads to make any lower rates to Pacific terminals than to intermediate points. This order was entered June 30 last, and the roads were directed to make the proper changes in their freight rates by Oct. 15.

In the meantime Congress passed a law under which carriers are not permitted to file increases in rates without first obtaining the consent of the commission. The roads have filed their new tariffs under the order of June 30, but it appears that these tariffs will necessarily provide for increases in the rates to Pacific terminals. Although these rates are filed in pursuance of the commission's intentions, there have been, even since, some important developments which make it necessary to give the freight question further consideration. Prominent among these is the purchase of steel on the coast for shipbuilding. The commission has therefore entered an order postponing the effective date of its order of June 30 and refusing to permit the roads to file their proposed tariffs under that order at this time.

In the meantime the commission will take up for consideration the broader question of the procedure under the new amendment to the law. A regulation under this new amendment has been issued by the commission reading as follows:

Until Jan. 1, 1920, no increased rate, fare, charge, or classification shall be filed except after approval thereof has been secured from the commission. Such approval may, in the discretion of the commission, be given without formal hearing, and in such case shall not affect any subsequent proceeding relative to such rate, fare, charge, or classification.

A general hearing on this question will be held before the commission on Oct. 15. Shippers and carriers generally have been invited on that date to present their views. In explanation of the new policy the commission states that the new regulation means that the approval of a proposed increased rate, fare, charge, or classification must be secured before the tariff containing it is filed with the commission by the carrier. Requests for such approval must be made by applicants to the commission.

Cooling Shell Forgings

The apparatus for cooling shell forgings illustrated in THE IRON AGE of Sept. 13 is, it now appears, protected by patents granted to C. P. Sandberg in Great Britain and in the United States and Canada. Authority was given the Canada Cement Company, Ltd., by the Ministry of Munitions under an arrangement by which the Sandberg concern waived royalty or payment in the manufacture of shells for the British Government during the period of the war. As will be recalled, the apparatus provided for the delivery of compressed air through numerous orifices in pipes inside and outside of the hot forging, thus to increase the production, while maintaining satisfactory physical characteristics.

To provide technically trained men in the automobile industry, especially for automobile service stations throughout the country, the Packard Motor Car Co. is opening a technical service training school, open to men who have had any automobile experience. Every man accepted for the school will be paid while being taught.

STEEL MAKING IN JAPAN

Capacity Is Being Rapidly Increased—New Companies Organized

WASHINGTON, Oct. 9.—Official reports have been received here to the effect that Japan is largely increasing her iron and steel output. How far this is due to the export restrictions now being imposed by the United States is not known. The report, however, coming from the American Consul General at Yokohama is very timely. Among other things the Consul General said:

"Projects for two new steel factories in the vicinity of Yokohama are reported by the *Japan Advertiser*. The Asano Steel Works is projected by Soichiro Asano, and the other plant is that of the Japan Steel Pipe Factory. Mr. Asano is the president of the Toyo Kisen Kaisha and the founder of the Asano Shipbuilding Co. His shipyards, established only 10 months ago, are now operating at full capacity. The Mitsubishi Engine & Iron Works, Nagasaki, and the Kawasaki Dockyard Co., Kobe, also have found it imperative to be able to produce their own steel. Ryozo Asano, managing director of the Toyo Kisen Kaisha, and son of Soichiro Asano, has sailed for the United States, where he will investigate the steel industry and make purchases of the latest steel-producing equipment.

"Regarding the new Asano Steel Works, Mr. Kato, managing director and chief engineer of the Asano Shipbuilding Co., is quoted by the *Advertiser* as stating that the independence of the supply of steel has much to do with the independence of the shipbuilding industry of Japan.

"The Japan Steel Pipe Factory, which will soon be established near Yokohama, has purchased mining rights in Nara and Fukushima prefectures with the object of getting ores. The Japan Steel Co. at Murotan, in the Hokkaido, the largest steel company in Japan, is to double its capital of \$7,477,500, according to the *Advertiser*.

"The Japan *Chronicle* states that several projects have been launched in that country for establishing iron works. The Tokai Kogyo Kaisha, recently established, has bought an extensive tract of land in a suburb of Wakamatsu, where workshops are being erected.

"Another iron-manufacturing company in course of flotation is the Fuji Seiko Kaisha, with a capital of \$2,991,000. The Nippon Kotetsu Kaisha also recently invited subscriptions from the public to its capital of \$498,500. There is, besides, the gigantic project of the Kuhara family of Osaka, with a capital of \$4,985,000. Mr. Yasukawa, a well-known mine owner of Kyushu, has acquired an iron mine in China, and is arranging to establish a company with a capital of \$4,985,000 for the purpose of exploiting it. The Toyo Seitetsu Kaisha has lately increased its capital to \$14,955,000, and has bought an extensive site in Kyushu for new workshops, the building of which will be commenced in April next. When these new factories have been completed the company will be able to produce 170,000 tons of pig iron a year."

Contracts for Wharves at Ojibway

The Great Lakes Dredging Co., Ltd., of Canada, Port Arthur, Ont., has been awarded the contract for the construction of wharves, slips and dredging in connection with the steel plant to be erected for the Canadian Steel Corporation, Ojibway, Ont., which has some 2500 acres on the Detroit River. The slips will be 2100 feet long by 250 feet wide. The Canadian Steel Corporation is asking for tenders for 150 houses to be built to accommodate the workmen. All construction work on the plant is to be rushed, as the corporation desires to turn out shipbuilding plates to help the Allied governments.

[The above interesting statement comes from Canadian sources. The Canadian Steel Corporation is a subsidiary of the United States Steel Corporation.—EDITOR.]

Electric Welding Plant Acquired

As a step in the litigation growing out of the patents on the electric welding process, a large number of manufacturers and users of electric welding equipment have purchased the plant of the National Electric Welder Co., Warren, Ohio. The electric spot welding process is controlled by the Thomson Electric Welding Co., Boston, which claims the right to charge a royalty for the use of the process. The Thomson company, it is claimed, also fixes the price which the lessees of spot welding machines must pay. Manufacturers and users of spot welding machines formed an organization to fight the Thomson patents in the courts and recently secured an option on the National plant.

The Thomson company brought suit in the Federal court at Cleveland to enjoin the consummation of the deal to purchase the Warren plant, alleging a conspiracy to destroy its licensing system and invalidate its patent. The complaint alleges that the National Electric Welder Co. was one of the licensees and that the defendants were endeavoring to induce it to violate its contract. The defendants denied this in their answer, but admitted their intention to contest the validity of the patent on the ground that F. P. McBerty, secretary and treasurer of the National Electric Welder Co., invented the electric spot welding process in 1901 and put it into practical operation two years before its discovery by anybody else.

Judge Westenhaver in the Federal court in Cleveland heard the motion for a preliminary injunction and overruled that part of it asking for an injunction against the purchase and sale of the Warren plant, but restrained the National Electric Welder Co. from violating its license agreement and also the other defendants from inducing it to violate the agreement, at least until the merits of the suit are passed on. It is expected that the basic issue as to the validity of the Thomson patent will be decided soon either in Cleveland or in Boston, where suits somewhat similar are pending.

The officers of the new Federal Machine & Welder Co., formed to purchase the National plant, are T. H. Kane, president; Henry C. Milligan, vice-president, and T. M. Seymour, secretary and treasurer.

Revised List of Articles Not to Be Exported

WASHINGTON, Oct. 8.—The necessity for conserving articles useful for war purposes, the supply of which is limited, has induced the Exports Administrative Board to prepare a revised list of commodities of this class, the exportation of which is practically prohibited. Export licenses may be granted, however, for the above articles when destined for actual war purposes, or when they will directly contribute thereto; and in certain unusual cases when such exports will contribute directly to the immediate production of important commodities required by the United States; and also in certain other cases where the articles may be exported in limited quantities without detriment to this country.

The list includes the following:

Boiler tubes (iron and steel), boring mills, vertical, 42-in. and larger, chrome nickel steel.

Ferromanganese, ferrosilicon, ferrovanadium, glycerin, iron and steel plates, including ship, boiler, tank, and other iron and steel plates $\frac{1}{8}$ in. thick and heavier and wider than 6 in., whether plain or fabricated, lathes with 30-in. swing and larger.

Oil-well casing, pig iron, planers, metal working, 36-in. wide and larger.

Scrap iron, scrap steel, searchlights and generators (suited for Army and Navy use), spiegeleisen, steel billets, steel blooms, steel ingots, steel sheet bars, steel slabs, tin plate, toluol, tungsten.

Applications may be made at the Bureau of Export Licenses, 1435 K Street, N. W., Washington, D. C., or at its branch offices or agencies at other points.

The Westinghouse Pacific Coast Brake Co., San Francisco, has removed its offices from the Pacific Building to the new Southern Pacific Building on Market Street.

The Two Roll Straighteners at Ends of Cooling Beds



Another New Bar Mill at Youngstown

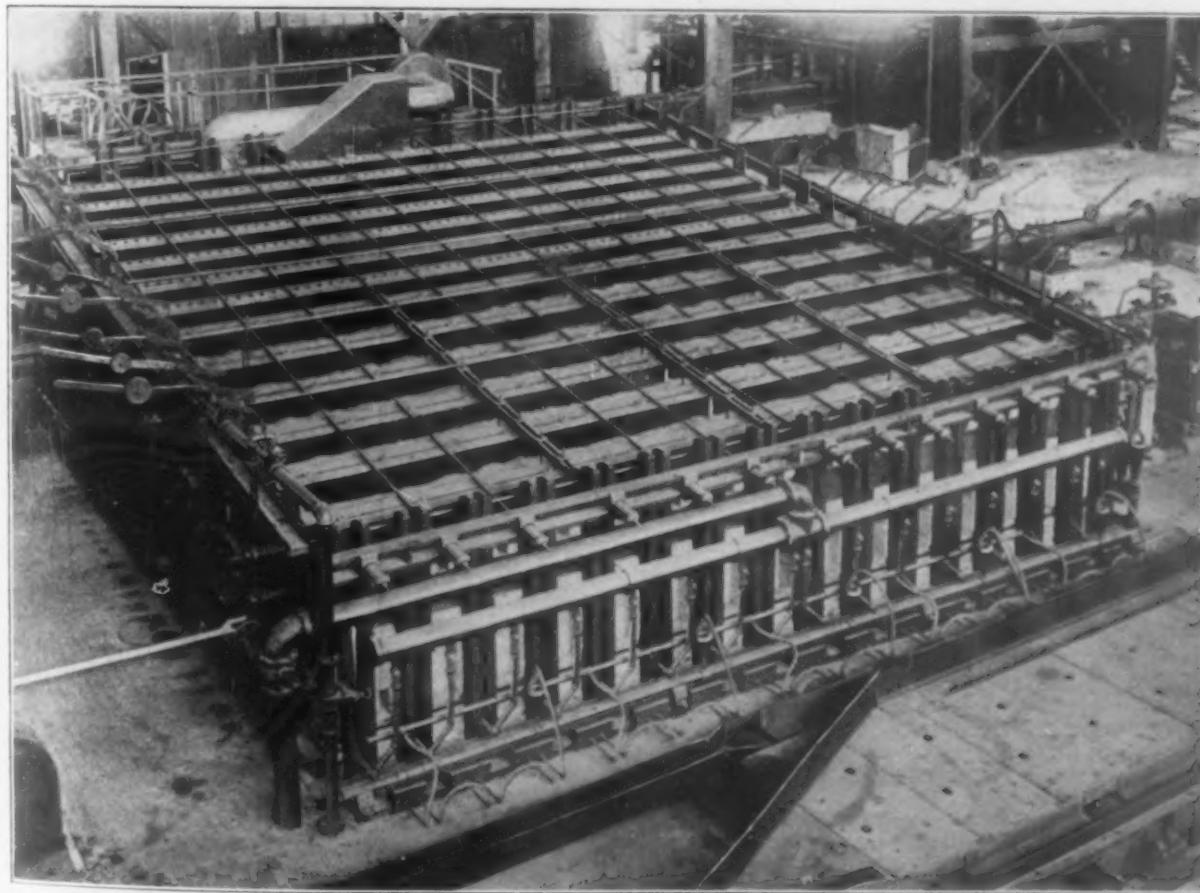
Youngstown Sheet & Tube Co. Starts
Its New 12-in. Mill at Struthers,
Ohio—One of Unusually Heavy Type

THE new 12-in. merchant bar mill at the plant of the Youngstown Sheet & Tube Co., Struthers, Ohio, was put in operation on Sept. 4. It was built by the Morgan Construction Co., Worcester, Mass., and is designed to take billets of $1\frac{1}{2}$ x $1\frac{1}{4}$ -in. to 3 x 3-in. sections in 30-ft. lengths, and reduce them to finishing sections of $\frac{1}{2}$ to 2-in. rounds and squares, $1\frac{1}{4}$ to $4\frac{1}{2}$ -in. flats and angles up to 3 x 3 in., with a capacity under normal conditions of 10,000 tons per month of average sections. Adjoining the 12-in. mill is the 9-in. mill, also built by the Morgan Construction Co., a description of which appeared in THE IRON AGE of April 5, 1917. Both the 9-in. and the 12-in. mills are served from a common billet yard, and use a common warehouse for stock purposes.

The billet yard at the north end of the mill is 90 ft. wide and 594 ft. long. It is served by one 15-ton double-hook crane and two standard gage tracks for unloading

material. In its east end is located the roll shop. The warehouse at the south end is 100 ft. wide and 396 ft. long and is served with one 15-ton double hook crane and has a 75-ton capacity platform scale 40 ft. long and four depressed tracks for loading material from stock. The 12-in. mill building is 100 ft. wide x 1150 ft. long. One 15-ton single-hook crane serves the mill, and one 15-ton double-hook crane is used for stock handling. The buildings are of steel construction, and with the exception of the billet yard have the Pond type roof, with swinging windows of steel sash and operating device.

A charging conveyor 82 ft. long carries the billets from the skids in the billet yard to a 30 x 30-ft. Morgan continuous heating furnace, from which they are discharged to the roughing mill by means of a Hawthorne twist push-out. The furnace uses as fuel coke oven gas from the East Youngstown coke plant.



Billets charged in the far end of the continuous heating furnace are discharged by the push-out shown at the left and the first roughing stand may be seen at the right. Coke oven gas is used and the gas boosters are shown.

The roughing mill is a five-stand continuous train of 14-in. rolls, with an electrically driven dividing shear placed midway between the No. 2 and No. 3 stands. The four-stand 12-in. finishing mill is made up of two trains arranged in pairs of two stands each, placed in a staggered position to one side and in front of the roughing mill. These roughing and finishing trains are driven by a Nordberg 44 x 50-in. uniflow engine of the poppet valve type, running from 65 to 100 r.p.m. and developing up to 2100 brake hp. A description of this engine appeared in THE IRON AGE of July 20, 1916.

The cooling bed is 300 ft. long, and is of the double universal type. Located at the end of the bed, and on each side are the roll straighteners of special design, having all driving gears mounted in oil-tight dust-proof housings, and without gears on the ends of the straightener rolls. Beyond the straighteners are located the 300-ft. long front shear tables, bar shears, 75 ft. back shear tables and scales, where the material is sheared to desired lengths and weighed before shipping or stocking. A scrap shear is located near the mill

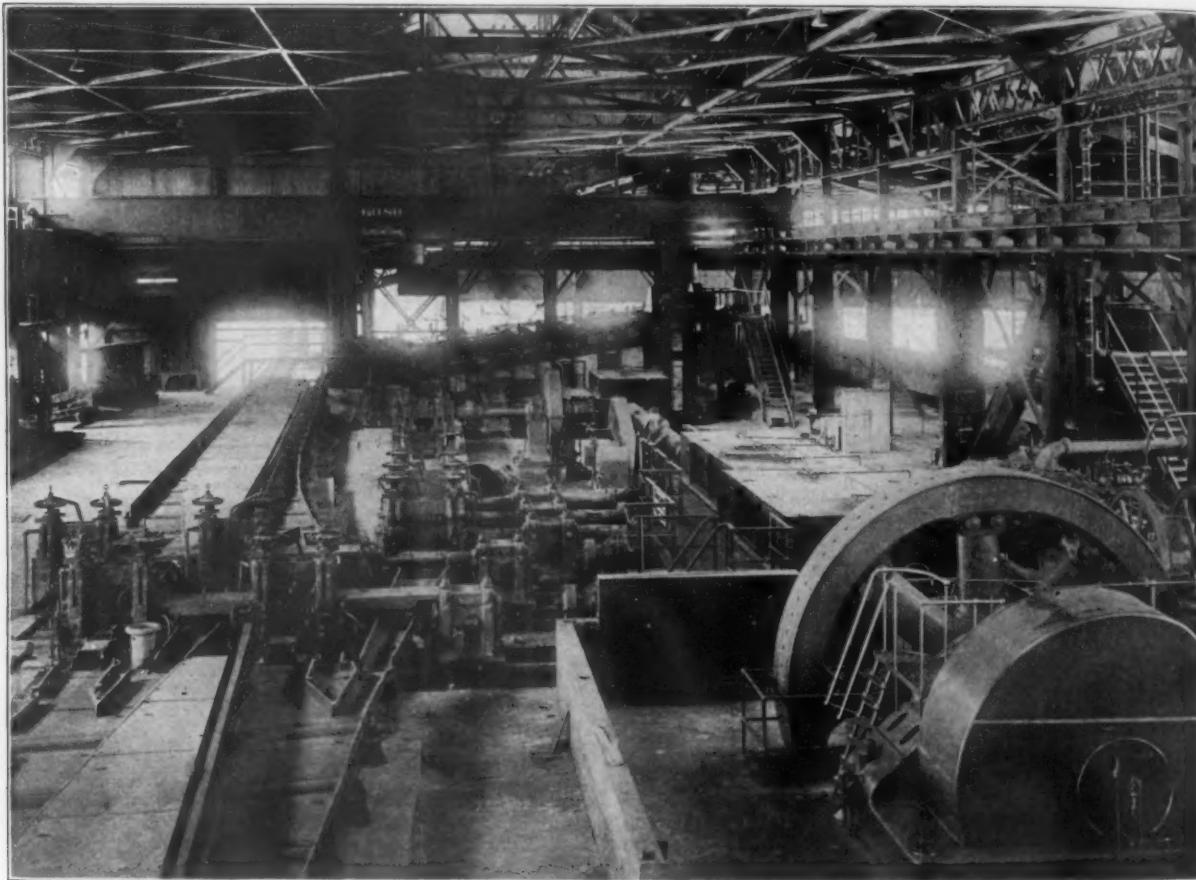
MANGANESE ORES OF VIRGINIA

Character of the Deposits in the Appalachian Mountain and Other Districts

BY MARSHALL HANEY*

MANGANESE ores are widely distributed in the United States, but only a few localities are of importance, and the manganese mining industry, never considerable, had been on the decline for a number of years up to the impetus given by the European war and the greater impetus since our country has gone to war.

Domestic ores are of much lower grade than the imported ores, and generally require washing and sorting in order to make them marketable. The domestic demand for the higher grade ores has been supplied largely from Russia, India, Brazil and Cuba. Manganese deposits are found in the Atlantic States from Vermont to Alabama and among these States Georgia and Virginia have led in production.



The roughing and finishing mills driven by a Nordberg uniflow engine. The heating furnace may be seen in the background

end and at the side of the cooling bed, while at the south end of the building in the rear of the back shear table and scales is located a cross roll straightener for straightening rounds.

Electric current for operating the transfer tables, cooling bed, etc., is generated at the rod and wire power house. All control apparatus for operating the motors in this mill is concentrated in two control houses centrally located with respect to the motors. Power from the main generating station is fed into busses within the control houses. Each control panel has its individual connection to the bus. All wiring from the control houses to the motors is carried in fiber ducts, laid in concrete beneath the floor.

Safety in cutlery grinding has been made the subject of an article by Earl B. Morgan, safety engineer, Norton Company, Worcester, Mass., and it has been printed for distribution by that company in a little illustrated pamphlet.

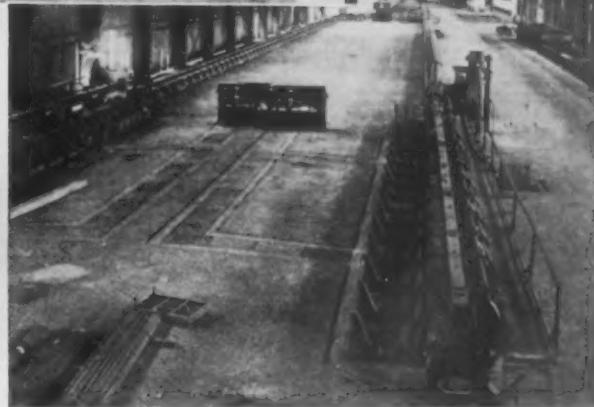
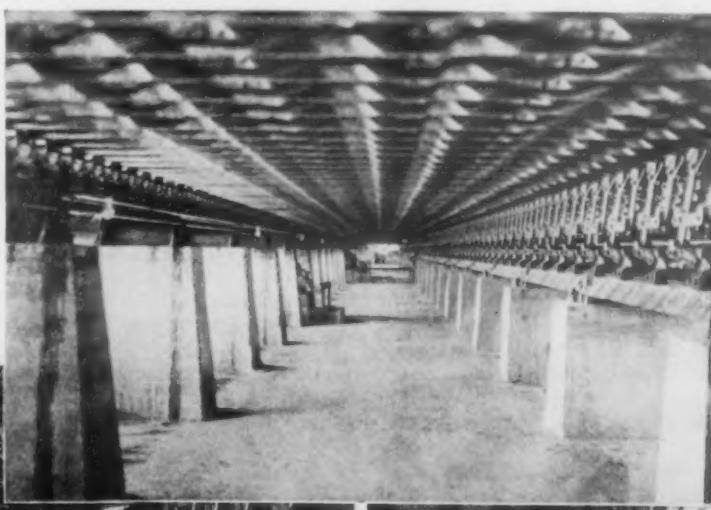
Virginia has two distinct districts—the James River area in the Piedmont region and the Appalachian Valley area. The beginning of manganese mining in Virginia and probably in the United States was in 1857, when 100 tons of ore was reported taken from the lands of Joshua Robertson, about five miles from Waynesboro, Augusta County, in the Shenandoah Valley. In 1868 and 1869 about 5000 tons of manganese ore was mined near Warminster, Nelson County, which really marked the beginning of systematic mining of manganese in that State. Virginia has more known deposits of manganese, extending over a large territory and more localities have been worked with a larger manganese production than in any other State in the Union. The ores are usually found embedded in the mantle of residual clays overlying the rocks from which the clays have been removed by the usual process of decay. The ore is distributed through the clays in an irregular manner in the form of pockets or lenticular

*Mining engineer, Geer, Va.

masses, rarely as distinct beds; as veinlets and stringers cutting the clays in all directions; as single nodules or concretionary masses assembled in the clays, and as small decimated grains scattered through the clays.

Both in the Piedmont and Valley regions the ores distributed through the clays conform in a general way to the bedding of the inclosing clays and the ores cut the clays in all directions. The pockets show much variation in size and number, ranging from small nests to bodies yielding many tons of ore. They are rarely composed of solid ore, free from clay, but the ore forms thickly studded nodules in the clays. The proportions of ore and clay vary greatly.

Only the oxides of manganese occur in Virginia and of these pyrolusite and psilomelane greatly predominate. The



Views Above and Underneath the Double Universal Cooling Beds and the Shears, Bar Pilers, etc.

oxides occur in varying proportions. The ore is usually partly or entirely crystalline, of a dark steel blue color, and of the nodulose type which nearly always displays the complete or partial layers of concentric structure or concretionary masses.

The rocks in the Piedmont region are schists, gneisses and granites. They are derived in part from the original sedimentary, and in part from igneous masses by metamorphism. Workable deposits of manganese are found in the following counties in Virginia: Albemarle, Amherst, Buckingham, Appomattox, Campbell, Nelson, Pittsylvania and Spotsylvania. Some of the mines in these counties have been worked for many years and have yielded a large quantity of manganese.

The Appalachian Mountain or Valley region includes all the counties lying west of the Blue Ridge on the eastern side of the valley. This region is the chief source of manganese in Virginia as well as in the United States. The principal belt in this region lies along the western base of the Blue Ridge on the eastern side of the valley. This belt has a length of 300 miles in Virginia and workable deposits have been found in the 12 counties bordering on the western base of the Blue Ridge. Along this belt are found the large bodies of iron ore which are associated with the so-called Potsdam or formation No. 1 of Rodgers, and the ores of manganese are associated more or less with those of iron.

Since the European war began many new discoveries have been made in Virginia and have been developed into productive property, and other promising deposits wait for capital to take hold of them.

Appeal to Farmers to Collect Scrap

WASHINGTON, Oct. 9.—Farmers are being urged to participate in the profits derived from scrap. The present situation has been called to the attention of farmers generally and of all others who may be in a position to accumulate scrap by the United States Geological Survey. The Survey claims that even at the recently fixed prices of iron and steel it should be possible for most farmers to reap an overlooked profit through the sale of old iron and steel scattered about their premises; that the saving of such old scrap metal will help to meet the present serious deficiency in the supply of iron and steel; that the use of the old metal will accomplish savings in coke which is now to be had only at

unprecedented prices; that the delivery of the old iron and steel at foundries far from iron mines and big steel centers will correspondingly relieve the excessive strain on the mines, some of the furnaces, and the railroad and boat traffic in the coke and iron producing districts.

In the northeastern States scrap metals have long been more or less fully taken care of, mainly by the ubiquitous junk man, and along most railroads and about most industrial plants they are now salvaged systematically. However, in the greater part of the United States little attention is given to saving the old metal scattered about the industrial plants of the farmers, where abandoned binders, plows, mowers, rakes, etc., decorate the fence corners and roadsides, and discarded stoves, pumps, pipe, and small utensils rust about in the barns and sheds.

Life Insurance for Shepard Employees

The board of directors of the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has requested that the company's next quarterly bonus announcement be deferred until a plan for life insurance for all employees six months in the company's employ can be included. It is expected that the quarterly bonus will be continued on the same basis as for the previous quarter, and that in addition the insurance plan will provide for payment of wages to heirs for a period of one year after the death of an employee. Employees entering the company's service after the inception of the insurance plan will be subject to a medical examination. A reserve of \$10,000 was set aside to finance the insurance.

Electric Pig Iron in War Times*

Low Phosphorus Iron from Steel Scrap in Canada—Use of Iron Ore Direct or Ore and Steel Scrap Mixed

BY ROBERT TURNBULL

THE abnormally high prices which are at present being paid for iron and steel products and which have been ruling for the last 18 months have seemingly failed to stimulate or encourage the manufacture of pig iron from ore in the electric furnace. Although from \$50 to \$80 per ton is now being paid for the different grades of pig iron, no progress has been made in the United States or Canada in the production of electric pig iron from ore, and it may safely be said that outside of Sweden and Norway this method of making iron in the electric furnace is practically *nil*. That pig iron could be made from ore electrically under present conditions, and at the same time yield a handsome profit, there is not the slightest doubt, but there are many difficulties in the way of the prospective manufacturer and one of the most serious is the shortage of power.

In the early part of 1906, when the smelting of pig iron in the electric furnace was undertaken by the Canadian Government, the report issued some time afterward claimed that the results of the experiments had proved that four tons of pig iron could be produced per horse-power year; in other words, this amount of iron could be produced with an expenditure of about 1650 kw. hr., whereas the present Swedish practice, where large furnaces are used, shows that from 2500 to 3000 kw. hr. is required to produce one gross ton of gray iron.

A few years ago the writer made some experiments with a single-phase furnace using about 650 kw., the ore used being hematite, containing from 50 to 52 per cent metallic iron. This furnace was operated for several weeks and the expenditure of energy per gross ton of pig iron produced was 2300 to 2400 kw. hr. It will therefore readily be seen that to produce any considerable quantity of iron in the electric furnace, large amounts of power will be necessary, and this, coupled with the fact that such an enterprise could only be operated under existing conditions, which are liable to change at any moment, has no doubt deterred investors from risking the capital necessary for such an undertaking.

The writer's own experience has not gone to show that any advantage has been gained either by lowering the expenditure of power or decreasing the gross cost of the product by the use of the shaft furnace, such as is used in Sweden, for, unless the gases are utilized, the shaft furnace becomes a complicated, expensive and unnecessary piece of apparatus. A well-designed ordinary electric smelting furnace, with partial roof and automatic charging from overhead hoppers, will produce a cheaper pig than the shaft furnace, and the first cost of plant would be considerably less.

Pig Iron from Scrap Steel

With the war, however, a new industry has been created for the electric furnace, which, owing to its practically low initial cost in plant and low power consumption, bids fair to become very popular. This is the production of pig iron from shell turnings and shell scrap.

As the specifications for steel to be used in the manufacture of shells call for low phosphorus and sulphur, it is possible in the electric furnace to produce a low phosphorus pig iron from such scrap at a figure which, given the present selling price of low phosphorus pig iron, yields a handsome profit, while very little refining is necessary. Any type of steel furnace can be used for this process, and it is not even necessary to

have a furnace of the tilting type when little refining has to be done, as by special manipulation of the slag in the furnace a certain amount of phosphorus can be removed and sulphur is always to some extent eliminated by the basic slag employed.

The possibility of this process was first brought to the writer's attention in the fall of 1916, and experiments were immediately undertaken in a small furnace at Orillia, Ontario. These experiments having proved the process to be a feasible one, a new single-phase furnace was built and has been in successful operation since January of the present year. From 6 to 7 tons of low phosphorus pig iron is being produced per 24 hr., the amount of power used on the furnace being about 250 kw.

Furnaces for this work have since been installed at St. Catharines and Collingwood, Ontario, also at Shawinigan Falls, Quebec, and a number of furnaces are now operating in the United States.

At St. Catharines the furnace is of 6-ton capacity, 3-phase, operated by Packard transformers of 1200 kw., but only 700 kw. is being used at the present time, owing to the shortage of power. The daily output is about 20 tons. It is estimated that the production will attain 35 gross tons with the full power of 1200 kw.

Details of the Process

The operation is in many respects similar to the making of steel in the electric furnace, the refining process for the elimination of phosphorus being somewhat different. The charge consists of shell turnings, the necessary carbon base, which may be charcoal, coke or coal, ferrosilicon and lime. Manganese is not added, as care is taken in the process to conserve the manganese already contained in the turnings. The furnace is of the fixed type, with a carbon bottom and silica brick lining. There are two charging doors and one tap hole, similar to open-hearth furnaces. The furnace is controlled by automatic regulators, which eliminate to a great extent manual labor on the furnace, besides giving a much steadier load than is possible by hand control. The product is cast in sand, the pig beds being placed about 30 ft. from the furnace.

In our Orillia plant the iron is cast into iron molds, which make a better looking pig than sand casting. The return in iron as compared with the scrap charged is about 95 per cent, and, as about 5 per cent is added to the iron in the form of carbon and silicon, the total loss is about 10 per cent of scrap charged. The pig produced is very tough and the analysis is fairly uniform, as can be judged by the following table of consecutive heats:

Analyses of Low Phosphorus Pig Iron Made from Scrap in an Electric Furnace in Canada

Heat No.	Silicon, Per Cent	Sulphur, Per Cent	Phosphorus, Per Cent
237	1.45	0.025	0.025
238	1.83	0.029	0.031
239	2.82	0.030	0.033
240	2.11	0.029	0.027
241	1.88	0.025	0.027
242	2.49	0.027	0.027
243	1.21	0.035	0.040
244	2.35	0.030	0.030
245	1.25	0.029	0.031
246	1.55	0.027	0.027
247	1.59	0.028	0.031
248	1.50	0.025	0.029
249	2.02	0.029	0.032
250	1.50	0.022	0.038
251	1.41	0.029	0.033
252	1.50	0.025	0.023
253	2.20	0.025	0.027
254	1.50	0.027	0.038

*A paper, substantially in full, presented at the thirty-second general meeting of the American Electrochemical Society, Pittsburgh, Oct. 4, 1917. The author is electric furnace engineer, Welland, Ontario, Canada.

The carbon is very rarely over 3 per cent; above this point any extra carbon added is very destructive to the lining and roof of the furnace. A roof will last from 150 to 200 heats; the roof conditions are being gradually improved and 300 heats may yet be realized for one roof.

The process is not a new one, as attempts were made several years ago to make pig iron from scrap steel, but the cost was found to be prohibitive.

Using Iron Ore and Scrap

The writer has also made some experiments in operating the pig-iron furnace for ore, before mentioned, by mixing 50 per cent each of scrap and ore in the charge. The result was an increased production from about 6 tons on ore alone to 11 tons with the mixture. The same amount of power was used in both cases.

In passing, it might be said that some of the blast furnaces in the States are now mixing considerable quantities of steel turnings with the ore, in order to increase their output.

Whether the production of pig iron from scrap will be feasible electrically after the war and when normal conditions are again with us is not a settled point. The cost of production is at present high and would be prohibitive under normal conditions. It must be remembered, however, that costs today are possibly 50 percent higher than they were three years ago, and it is the writer's conviction that, provided future experiments find a means of eliminating phosphorus from the iron without removing the slag, the process can be profitably operated in normal times, at least in Canada, where low phosphorus pig iron is always a dollar or two higher than in the United States.

Coolers for the Roof

In conclusion, although a little foreign to this paper, the writer calls the attention of all those interested in steel furnaces to the roof coolers, which are placed around the electrodes in order to keep the bricks at that point as cool as possible. Recent practice at St. Catharines has shown that the life of the roof can be prolonged materially by correct application of these roof coolers, especially the ring of bricks around the electrodes. These coolers should be made to the exact form of the roof, and should rest on the bricks which form the ring around the electrode, and not on any packing between these bricks and the cooler. They should not be flanged, but cast to a special form, so that the cooling water will be at an equal distance from all outside surfaces. The writer will be glad to give any further particulars to those interested.

Embargo Causes Trouble in Canada

TORONTO, ONT., Oct. 8.—Canadian conditions in the steel trade are becoming more and more serious on account of the embargo placed on these products by the Washington Government, and indications point to a difficult situation for consumers to contend with. Market conditions are as a consequence very unsettled and the trade is anxiously awaiting developments. It is expected that the situation will be somewhat relieved, now that the United States Government has fixed prices on steel, iron ore, pig iron and coke. The effort made to have the embargo modified does not appear to have met with much success as the situation is as acute as ever. Existing conditions will benefit Canadian mills to a certain extent, but those consumers who rely on imported steel products will suffer considerable inconvenience. It is stated that shipbuilding and companies engaged in turning out products in connection with the war will not be interfered with, but other industries using iron and steel will be seriously hampered in their manufacturing activities.

The Tricity Steel Co., St. Louis, recently incorporated in Delaware with capital of \$1,000,000, has acquired eight acres in the city industrial section for the erection of rolling mill and works to cost about \$100,000. The company will specialize in the production of rail joints, tie plates and other railroad supplies.

BILLIONS APPROPRIATED

Congress Likely to Make a Change in Method of Voting Money

WASHINGTON, Oct. 9—Expenditures amounting to nearly \$20,000,000,000 is the record left behind by the special session of Congress which came to a close last Saturday. This is a fact which stands out above all else and is ranked in importance only to the new war tax law which will multiply the annual revenues of the Government three times.

The largest appropriations made in any fiscal year of the Government were for the fiscal year which ended June 30 last, when the appropriations totaled \$1,625,484,995.53. During the six months of the past session of Congress, appropriations amounting to \$17,001,966,814.91, including the \$7,000,000,000 to be loaned to our Allies, were authorized. In addition to this amount, Congress authorized contracts to be entered into or obligations to be incurred subject to future appropriations aggregating \$2,419,258,393.50, making a total of appropriations and authorizations of \$19,421,225,208.41.

Whether or not it was these large appropriations which prompted it or not, the fact does stand out that for once Congress is likely to abandon its obsolete method of handling appropriations. Representative Fitzgerald, of New York, introduced in the House during the closing days a resolution which would combine all authority to report appropriation bills in the hands of one committee. While this resolution is certain to meet with the opposition of the chairmen of the numberless committees heretofore possessing authority over the various appropriation bills, it is sure to win support in other quarters because of the serious business of war expenditures before the Government.

President Wilson has himself come out in favor of the Fitzgerald amendment. In a letter under date of Oct. 4, the President wrote the New York representative endorsing the proposed step which brings the Congress that much nearer the adoption of a budget system of handling governmental appropriations and expenditures.

The session of Congress which just closed is notable for other reasons than the large appropriations made, however. It is notable for the fact that practically all of its deliberations were over war measures.

New Installations of Heroult Furnaces

Licenses for the installation of the following Heroult electric steel furnaces have been issued by the United States Steel Corporation:

The Hess Steel Corporation, Baltimore, Md., will install four 6-ton furnaces for making forging ingots. This is in addition to two furnaces of the same type already operating.

The Watertown Arsenal, Watertown, Mass., will install one 2-ton and two 6-ton furnaces for the manufacture of steel castings and forging ingots.

The Twin City Forge & Foundry Co., Stillwater, Minn., will install one 3-ton furnace for making steel castings and forging ingots.

The American Bridge Co., at its Gary works, Gary, Ind., will install one 6-ton furnace for making steel castings and forging ingots.

The installation of these nine furnaces brings the total operating or contracted for in the United States and Canada to 144.

A new plant for making pig iron by electricity has commenced operations at Porjus Falls, Sweden, according to German papers. It takes its power from the large power station nearby. The first furnace now at work produces 8 tons per day; this will be raised to 20 tons with the installation of a second furnace. A third furnace will produce ferrochrome and other alloys.

Although many of the 25,000 employees of the B. F. Goodrich Rubber Co. of Akron were affected by the selective conscription act, the corporation asked exemptions in only 17 cases, all of which were granted.

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Contracts and Fixed Prices

The iron and steel trade has accepted with very good grace the condition that prices are to be fixed. The feeling of patriotism is doubtless the dominant one, yet the fact must not be ignored that the system of fixed prices bears promise of advantage to the majority, as well as relief from trying uncertainties. Such complaint as there has been has naturally come largely from those who may be placed at a disadvantage through their having signed contracts to accept material at prices higher than those now fixed or about to be fixed. The only really formidable problem in the whole matter of price fixing is this question of contracts.

The contract problem is not before the trade as a business issue. It is before Washington as a legislative issue. There is nothing in existing law touching upon the question of contract abrogation. There was nothing in the recent agreement between the Government and the producers that affects existing contracts. Nor, finally, is there any disposition in the minds of sellers to consent to the abrogation of any contracts. In the discussion of the price-fixing measure that is to come before Congress upon its assembly in regular session in December there have been some expressions of opinion that contracts should be abrogated when they embody prices much higher than those fixed as selling prices for the future. Chairman Davies of the Federal Trade Commission, which drew the bill replacing the Pomerene bill, has strongly advocated the principle of contract abrogation as a necessary step in making price control really effective, and Dr. Walker, the chief economist of the commission, has testified along somewhat the same line.

The iron and steel trade has no occasion to consider the crossing of any bridge before the bridge is reached, and the matter of contract abrogation is far in the future—three months at the least, even assuming a legislative speed that cannot be expected. Before such a law could become effective a great deal of material will have been delivered. Practices as to contracts, however, are not uniform in all material. The cases of finished steel and pig iron stand in opposite relation in this respect.

The highest prices for steel, involved in the last stages of the steel market's great rise, were for rela-

tively early delivery. Contract buying for regular forward deliveries almost ceased last April, and the further advances that occurred in May and June referred very largely indeed to deliveries promised in from two to five months. Even allowing liberally for delays, there should be hardly any of the highest priced business left on books at the end of this year. A large volume of contract business at much lower prices will survive. It is quite improbable that there will be any large tonnage at such a premium over the fixed prices as would cause hardship to the buyer. In many cases, moreover, contract revision would be merely a repetition of the common practice in the finished steel market when there has been a decline.

In pig iron the case is quite different. As a rule, the higher the price the later the delivery. Only a very small tonnage of the pig iron placed under contract at prices above the fixed level was for early delivery. The lapse of time, instead of clearing away the highest priced iron, merely brings the trade to the time when it is to be offered for acceptance. To cancel all contracts for pig iron at higher than the fixed level, or to reduce them to the fixed level, would evidently be contrary to the conditions considered when the producers agreed to accept a \$33 basis. Many of the producers had been losing money on much of the iron they had delivered, through using high priced coke to produce low priced pig iron, and they had on their books, at the time of the agreement, contracts running both below and above the \$33 basis. In accepting the basis to govern future transactions they had in mind the fact that the two classes of iron would average. To carry out the spirit of the agreement, if the higher priced contracts were abrogated the lower priced contracts should likewise be abrogated, and no one has dreamed of such a thing being possible.

The idea of leaving the matter of contract abrogation to the judgment of any man or group of men cannot be entertained. The greatest confusion and friction would result from any legislative enactment whereby such contracts as might work a hardship to consumers were abrogated and others were not. No legislation on contracts can be considered for a moment that would not apply to all.

Those connected with the Federal Trade Com-

mission who have suggested the possibility of its being desirable to take action with respect to contracts have laid some stress on the idea that without such control the flow of material might be wholly upon contracts, leaving no material for the open market when the selling price has been fixed. For this there is, perhaps, a remedy already available, in the scope of the Priority Board. It exists already to regulate the flow of material, and to use its power to correct inequalities arising from the contract situation would not necessarily increase the confusion.

The problems presented appear formidable from the viewpoint that what is undertaken is to create, from nothing, a *modus vivendi* for the iron and steel trade. That is not necessarily the viewpoint. The future can be considered from the viewpoint that certain existing evils are to be corrected, or merely lived down by allowing time to elapse, and that certain evils that would have arisen in future, through the continuance of former practices, are to be forestalled. The Government did not wish to have private buyers bidding against it, and it did not wish to have continually, to the end of the war, the possibility that on every sale made to the Government the seller would be in the position of making a sacrifice. From this viewpoint the prospect is not so formidable.

Confusion on Costs

Some of the discussions of costs in the iron and steel industry tend to give an altogether erroneous impression as to the difference in cost between the so-called "integrated" and "non-integrated" producers. It is made to appear, frequently, that the unintegrated operations have a much higher cost and a much smaller profit than the integrated operations. That is not true. There is a difference, but it is small, not large. The misapprehension arises from regarding the integrated concern as one unit, and the unintegrated concerns as a series of units. The fact is that in each case there is a series of units, the series being in one case under a single ownership and in the other case under separate ownerships.

Considering the single operation of manufacturing steel from pig iron, for instance, the integrated company is looked upon as having its pig iron at a very low valuation, because the valuation is the bare cost of manufacture from the ore and coking coal in the ground up through the pig iron, while the unintegrated company is looked upon as having its pig iron at a high valuation, because there have previously been allowed profits on mining ore and coking coal, converting the coal into coke, carrying the ore and converting the raw materials of the blast furnace into pig iron.

If the manufacturing and administrative operations were precisely the same in the two cases, the cost of making a ton of steel plates would be precisely the same, whether by a fully integrated concern or by a line of unintegrated concerns. In either instance the profit could be distributed along the line. In the case of the unintegrated concerns, each would be allowed a profit on the process it con-

ducted. In the case of the integrated concern, a profit would be allowed to each of its departments, each department being exactly co-ordinate with the entire activity of one of the unintegrated concerns.

It might be thought from a practical viewpoint that in allowing profits it would be expedient to allow larger profits to the various unintegrated companies than would be allotted to the corresponding departments of the integrated company, because the latter might be able to make out somehow, through its larger profit in one department absorbing a possible loss in another department. That would be putting a premium on disorganization and could hardly be considered a justifiable expedient in any conceivable circumstances. If, for instance, it were possible to show that if a plate mill with open-hearth furnaces would lose money, or would make altogether too little profit, when buying pig iron at \$33 and selling plates at 3.25c., while an integrated company could make an amply large profit when selling plates at 3.25c., it would not follow necessarily that the 3.25c. price on plates was too low. It might be that the \$33 price on pig iron was too high.

The difference in cost between the group of departments in the integrated company and the total of costs of the chain of unintegrated companies is small, not large, as is suggested by much of the discussion that has appeared, including some of the testimony recently presented before the Senate Committee on Interstate Commerce on Sept. 21. It is a difference that puts some unintegrated companies out of the competition when prices are extremely low, but it is a difference that counts very little when the industry is even moderately prosperous.

The greatest difference between integrated and unintegrated practice is that the steel mill which must buy pig iron obtains it cold while the integrated companies use molten pig iron direct from their blast furnaces as largely as possible, and thus save the time and expense involved in reheating. In normal times the difference is only in the neighborhood of \$1 per ton, though no precise statement can be made, as conditions vary and so many facts must be assumed before a computation of the difference can be undertaken. In times of heavy pressure for steel there is normally room for argument that the use of cold iron cuts down output and thus decreases the earning power of a plant, but this difference cannot be set down in dollars per ton, to arrive at a cost from which the selling price can be computed, because it is a function of the final profit that is to be allowed.

Then there are differences caused by the unintegrated companies having to pay freights on intermediate materials, to a greater extent than is the case with integrated companies, but that is an incident rather than a necessary condition. An integrated company may have more steel-making capacity than blast-furnace capacity at Pittsburgh, and more blast-furnace capacity than steel-making capacity at Youngstown, in which case it will have to pay freight on pig iron from Youngstown to Pittsburgh. If the unintegrated companies chance to be located side by side there is no freight involved.

In administration there are savings to the integrated companies that are important in bad times

but are relatively unimportant in times like the present, when men are thinking in dollars per ton as compared with nickels or dimes in ordinary times.

Thus in the last analysis the real difference between the integrated and the unintegrated production is a small one, due to differences in manufacturing processes and in administration, these being actual physical conditions. The large differences sometimes spoken of are merely on paper. They could be eliminated by a proper presentation of the facts. The capital investment employed in producing a ton of plates, starting from nature, is substantially the same whether the operations are conducted by a fully integrated company or by a chain of unintegrated concerns.

Anti-Trust Suits to Be Pressed

From the beginning of active preparations for war, the impression has been steadily gaining ground that the National Administration has been losing its antagonism to "big business." Representatives of great corporations have been invited to participate in movements designed to strengthen the Government, and their offers of co-operation have been cordially accepted. It is therefore a disagreeable shock to have such an announcement appear as the following, which was sent out from Washington on Monday:

The war will have no effect upon the Government's prosecution of the five great anti-trust suits now pending in the Supreme Court. Solicitor General Davis said to-day that an agreement had been reached with attorneys for the International Harvester Co. whereby the dissolution suit brought against that company will not be considered by the court until after the arguments in the Steel suit, which will be called in January.

The Coal cases will come up in their regular order and will be reached late in November.

The Supreme Court to-day decided to expedite the Government's anti-trust suit against the United Shoe Machinery Co. and fixed Jan. 7 for rehearing arguments. The suit was dismissed by the lower court, which held the company blameless. The Government appealed.

It would appear that, if the Administration is really developing a more kindly feeling for business interests, the sphere of such a development has not yet expanded enough to take in the Department of Justice.

Conventions and the War

Soon after our entrance into the war a number of engineering and scientific societies advocated, "on account of the war," the cancellation of current conventions. Various reasons were put forward and some usually eventful conventions were abandoned. It is fortunate that others were not, for the value of the deliberations and results of many, if not all, of them was proved.

Week before last at Boston the largest gathering ever held of American foundrymen discussed cast-iron shells, ordnance steel castings, the crucible situation and other topics having to do with pushing the war. In the same week at New York the largest American exhibition of chemical products ever held revealed the wonderful strides that have been made in the manufacture of chemicals, dyes and coke by-products, due almost entirely to the war situation and valuable in its prosecution.

Last week at Pittsburgh a representative gathering of electrochemists enlightened the country by papers and discussions of new war products such as electric pig iron, chlorine, ferro-alloys and a symposium on war materials, all essential to war as well as to industry in time of peace. This week at St. Louis there is in session probably the most important meeting ever held on the subject of this country's manganese resources. Under the auspices of the American Institute of Mining Engineers, representatives of the mining and geological industries of the country are giving careful thought to relieving the country's great steel industry from almost entire dependence on foreign sources for its manganese.

Such meetings as these, not to mention the munitions sessions in May of the American Society of Mechanical Engineers and similar ones to come in December, are clearing houses for the exchange of ideas and information of which all need not be kept secret until after the war. England has by such gatherings made striking progress in meeting a serious sudden deficiency in important products—ferroalloys, electrodes and furnaces. Such conventions must here continue, despite the war.

CORRESPONDENCE

Wage Advances

To the Editor: The daily announcements of advances in wages or demands for advances have become a matter of expectation on the part of the public. That is, we expect to see these items in each morning's paper just as we do the financial page. After reading them we shrug our shoulders and view it simply as another result of the war.

As a matter of fact, the period when these advances began to attract notice antedates both this war and the high cost of living agitation. The original desire of the employee arose, not because he wanted to buy something which he could not afford, but because someone told him that his employer was getting all and he was getting nothing. In due time enough of these advances had been obtained in the various trades to increase the cost of each man's necessities. Not being far-sighted enough to anticipate this result, the workman naturally did not deduce the cause from the effect. Simply recognizing the fact that existence was paralleling income, each trade girded up its loins and proceeded to battle for more income to meet the high cost of living, which, in turn, was nothing more or less than the cost of high living; and by this latter is meant the natural desire of mankind to better his mode of living. Thus it has proceeded, perhaps not so like an endless circle, as in the same manner as skirmishers advance.

The war and then our entrance into it were only contributing factors—not causes. The statements which have been industriously circulated concerning enormous war profits and the idea that now our own Government is the ultimate consumer and must pay the fiddler, makes the employee unmindful how high prices go, believing he can keep on forcing up his pay.

Herein lies one very great opportunity for those in charge of propaganda for economy and thrift which has been started. A nation which learns actually to save something out of its income and to resist buying everything simply through the desire of having will slowly but surely waken to the fact that by acquiring both these traits the income will be sufficient. Every advance will then be sought on the basis of merit only.

With the income of all sufficient, the cost of living will not be increased except as affected by other economic causes. Furthermore with this one vexatious question settled, the manufacturer can give his attention and resources to the overcoming of mechanical or natural obstacles and thus reduce cost of production. And while the employee may not be convinced, it is nevertheless a fact that nine out of ten manufacturers are interested in this very thing, reduction of selling prices.

H. D. MURPHY.

Conserving Steel Tools

To the Editor: All substantial structures must have a foundation and a cornerstone. Steel, to-day, is the backbone of most large structures, and the most vital need of the railroad, the munition plant and the ship-yard. It is one material indispensable to the successful prosecution of the war as well as indispensable to the development of the country in times of peace.

Wise steps have been taken to safeguard the supply of steel to the munition industry and the car-building plants, but other less conspicuous industries appear to have been overlooked. One of these in particular—that which deals with the supply of steel tools—is so essential in its nature that even the steel industry itself may be said to depend upon it.

The greatest care should be shown in the use of steel tools. Their abuse at the hands of inexperienced workmen may cause a very acute situation far-reaching in its effect. The time is coming when every steel tool in this country will be urgently needed and when the utmost difficulty will be experienced in replacing such tools as have been worn out.

Let us take as a single illustration of the tool industry, the twist drill, and consider what place it holds in the modern scheme of things. Ninety-four different drill operations are required in the production of the Springfield rifle. That means that before an army of 500,000 men can set foot in France with proper equipment on his back, 188,000,000 holes must be drilled.

Industrial preparedness has taught us that it requires not less than two men sweating at home in the shops for every fighting man at the front. Millions of men must work with tools at home that half that number may fight.

Bear in mind that the common twist drill is only one tool of the many necessary for the production of the finished rifle. Perhaps you now begin to sense the importance of the steel tool with which you sometimes may become a bit careless.

No industrial preparedness or conservation campaign is complete which overlooks the tool industry. Each workman in the country, every manufacturer and consumer of tools should unite in an effort to make the present inadequate supply go as far as possible.

Sacramento, Cal. FRANK J. HULSBRINK,
Southern Pacific Store Department.

Ingot Production of the United States

The American Iron and Steel Institute estimates the ingot production of the country for the year 1917 at 42,260,000 tons, compared with 41,401,917 tons in 1916, which was the record year, and 31,284,212 tons in 1915. The production for the nine months ending with September was 27,935,411 tons by the 29 companies reporting, which made 88.14 per cent of the ingot production in the previous year. Other details of the production by the 29 companies are given in the following table:

	Total First Six Months	July	August	September	Total Nine Months
Open- hearth	13,681,483	2,152,479	2,251,013	2,195,556	20,280,531
Bessemer	5,164,139	777,171	862,873	770,064	7,575,247
Other	55,198	9,465	8,331	6,639	79,632
Total	18,900,820	2,939,115	3,123,217	2,972,259	27,935,411

Enlargement of the locks on the Welland Canal to permit of the construction of bigger ships on the Great Lakes for ocean service is under consideration by Canadian and American Government officials.

CONTENTS

Visualizing Promises of Material Shipments.....	865
Concrete Housing Development.....	867
Price Fixing by Edict or Agreement?.....	868
Great Increase in Exports of Explosives.....	869
Asks for Central Control.....	869
Small Squirrel Cage Induction Motor.....	869
The Iron Age in a Permanent Home.....	869
Steel Company's Celebration.....	869
American Electrochemists' General Meeting.....	870
Six-Spindle Head for Drilling Machines.....	873
Alternating Stress Experiments on Steel.....	874
Conservation of German Structural Steel.....	875
Foundry Exhibit at Boston.....	876
Record Exports of Tin Plates—Production in 1916.....	877
The German Tin-Plate Industry.....	877
Automobile Cylinder Grinding Machine.....	877
Burwell S. Cutler Made Chief of Foreign Commerce Bureau.....	877
Economical Production of Small Cores.....	878
Iron Ore Shipments in September.....	881
Transcontinental Rates.....	881
Cooling Shell Forgings.....	881
Steel Making in Japan.....	882
Contracts for Wharves at Ojibway.....	882
Electric Welding Plant Acquired.....	882
Revised List of Articles Not to Be Exported.....	882
Another New Bar Mill at Youngstown.....	883
Manganese Ores of Virginia.....	884
Appeal to Farmers to Collect Scrap.....	885
Life Insurance for Shepard Employees.....	885
Electric Pig Iron in War Times.....	886
Embargo Causes Trouble in Canada.....	887
Billions Appropriated.....	887
New Installations of Heroult Furnaces.....	887
Editorials:	
Contracts and Fixed Prices.....	888
Confusion on Costs.....	889
Anti-Trust Suits to Be Pressed.....	890
Conventions and the War.....	890
Correspondence	890
Ingot Production of the United States.....	891
Views on Steel Prices.....	892
Important Measures Postponed.....	892
Preparing to Entertain the Institute.....	892
War-Emergency Act	893
McKinley Memorial Dedicated.....	893
Iron and Steel Markets.....	894
Jones & Laughlin Co. Strike Settled.....	895
Experts for Machine Tool Supervision.....	895
Ford Contract Awarded	895
Iron and Industrial Stocks.....	895
Mining Engineers Meet.....	896
Prices Finished Iron and Steel, f.o.b. Pittsburgh.....	897
Metal Markets	898
Book Review	899
Pittsburgh and Nearby Districts.....	909
Increased Mineral Production.....	909
Germany's Supply of Copper.....	909
Personal	910
Coal Jobbers' Sales Regulations.....	911
Carwheel Makers Meet.....	911
National Association of Purchasing Agents in Session.....	911
Makers' Control of Resales.....	912
Russia's Iron and Steel Output.....	912
May Buy Canadian Equipment	912
Obituary	913
Tightening the Blockade Against Germany.....	913
Serious Labor Troubles	914
Huge Navy Program.....	915
Wages in Navy Yards.....	915
Pig Iron Schedule	915
Bessemer Sales Meet.....	915
The Closed or Open Shop?.....	916
National Defense Trade Committees Quilt.....	916
More Tinplate Next Year.....	917
Spain's Steel and Ore Output.....	917
Great Fleet of Airplanes.....	917
Machinery Markets and News of the Works.....	918

VIEWS ON STEEL PRICES

How Consumers Regard the New Era Shown in Extracts of Letters

As shedding further light on the attitude of consumers of iron and steel toward the prices which were promulgated from Washington on Sept. 24 on iron ore, pig iron, and steel bars, shapes and plates, extracts from some letters which have reached THE IRON AGE will be of interest.

To Buyers of Iron and Steel Articles

To convince its customers that they cannot expect reduced prices because the fixed iron and steel prices represent reductions from the recent levels of prompt delivery purchases, the Charter Oak Stove & Range Co., St. Louis, has issued a circular to its salesmen and customers as follows:

"Our present prices are based on our average cost of iron and steel, which happens to be practically the same as the prices fixed by the Government. We have never adjusted our prices to equal the high market prices that have prevailed. We gave our customers the full benefit of our fortunate purchases by averaging the costs of materials bought by us from time to time before the very high prices which have prevailed for some months were in effect.

"Since the day the Government named the figures we have tried to place orders on that basis, but were unable to do so either for immediate or future delivery.

"Manufacturers of stoves and ranges must make their selling prices based on their average cost of materials and in no case do we believe is any manufacturer's average cost of steel and iron at this time lower than the prices fixed by the Government, in some cases considerably higher. So you can see the manufacturer's cost is not reduced by the action of the Government.

"Another factor is the scarcity of all materials. Supply and demand is a most important factor in regulating prices of all materials, all labor, all finished commodities. Just now the demand is greater than the supply and stoves and ranges are no exception. The quantities on hand were never smaller nor the demand greater.

Price Declines Regarded Unlikely

"If the war continues into and through next year, we do not believe that any manufacturer who uses steel and iron will be able to obtain these materials as he wants them, or in the quantities that he needs, because of the Government's requirements which must be met first. If happily, the war should be brought to a close, a revival of building and other industries would result and use up all the metal that the close of the war would release, so there is no likelihood of an over-production as far as can be foreseen.

"So the reasonable and logical conclusion is that there is not the remotest possibility of a decline in prices. Dealers who postpone placing orders for their requirements for this fall and winter expecting a reduction in present prices will be disappointed and may cause their customers some inconvenience through not being able to obtain the stoves and ranges they require promptly."

Suggests Prices Take Effect at Future Date

A non-integrated maker of steel products, which holds that it was necessary to buy ahead at high prices to secure deliveries and which suggests that the fixed prices should go into effect at some future date, say April 1, 1918, so that opportunity would be given to work off high-priced stock, has written a letter to the President as follows:

"We are manufacturers of steel products of a finished nature and because of our limited size and means in this age of large corporations, are compelled to buy our raw material, steel billets. You are well informed as to the excessive demands over the past few years for this product, as well as the ever increasing prices. Because of this situation we have found it extremely

difficult to keep our mills in operation and, therefore, our management had the forethought, at least so we believed then, to purchase a sufficient quantity to carry us through the remainder of this year, 1917, and well into the first quarter of 1918.

"To this end, last spring we contracted for thousands of tons at the prices then prevailing, which as you well know, were several times the cost of production. Were your administration to bring about drastic reductions in the price of this commodity, it would mean ruination, not only to us but also to other concerns in a similar position, and lack of employment to our employees, of whom at the present time we alone have between 750 and 1000.

"We do not desire to make a selfish or unpatriotic plea. We are willing to do our part and realize the problems before the administration are serious and complicated and that any solution would work certain hardships, but we feel that if the price of steel is controlled and materially reduced and there are no steps taken to protect the consumer who has contracted for his requirements, many substantial, conservative firms like our own will become bankrupt, unsettling the industrial situation and tending to concentrate the power in the large corporations which own their raw material and whose cost of production varies only with the cost of labor and transportation."

Important Measures Postponed

WASHINGTON, Oct. 9—As Congress was about to adjourn, Senator Pomerene called up the exports combination bill and had it made the unfinished business of the Senate. This is the measure which would permit American producers to combine for export trade, or to organize joint foreign sales agencies. The means proposed in the legislation is to limit the application of the Sherman law and the Clayton law to domestic business and not to have it apply to export business.

The bill has already passed the House and when it was made the unfinished business of the Senate, Senator Pomerene explained:

"It is not my expectation or desire to ask for final action. My sole purpose is to have the bill made the unfinished business, so that it may be taken up at the beginning of the next session."

The export combination bill was recommended to Congress by the Federal Trade Commission and has the endorsement of President Wilson. It was passed by the House of the previous Congress only to die in the Senate.

One other measure which was put over until the next winter session of Congress is the Pomerene steel price fixing bill. This measure has already been considered by the Senate Commerce Committee and has been redrafted by a subcommittee. It is the intention of Senator Pomerene to urge the Senate Committee to action and report immediately Congress reconvenes in December.

Preparing to Entertain the Institute

Elaborate preparations are being made for the entertainment of the American Iron and Steel Institute that will hold its fall meeting at Cincinnati Oct. 26 and 27. Headquarters will be at the Hotel Sinton, where the banquet will be given on the evening of the twenty-sixth. The committee will also provide an extensive entertainment program for the ladies who will accompany the delegates.

The entertainment committee consists of the following: James I. Stephenson, Cincinnati Iron & Steel Co.; John E. Woods, Carnegie Steel Co.; B. W. Lamson, Bourne-Fuller Co.; Buckner Wallingford, Walter-Wallingford & Co.; D. B. Meacham, Rogers, Brown & Co.; George M. Verity, American Rolling Mill Co., and Thomas Quinlan, Cincinnati Chamber of Commerce.

The Steel Improvement & Forge Co., Cleveland, has recently installed four new 5 x 10 ft. heat treating furnaces in its Lakeside plant, 5418 Lakeside Avenue.

WAR-EMERGENCY ACT

Foreign Vessels Admitted to Coastwise Trade— Heavy Demands for Ships

WASHINGTON, Oct. 9.—At the urgent request of the Shipping Board, with the indorsement of the Department of Commerce and President Wilson, the Senate adopted without amendment the bill already passed by the House which will admit foreign vessels to our coastwise trade. This is a war-emergency measure. The act provides that the Shipping Board may suspend our navigation laws relating to the coastwise trade during the present war with Germany and for a period of 120 days thereafter.

This is one of the many measures framed to meet the emergencies created by the war with Germany and our participation in that war. Its enactment is intended to supply the needs of our domestic commerce growing out of the diversion of a large part of our coastwise tonnage to the over-seas trade.

The demands of our Army and Navy for transports, colliers, supply and munition ships to meet present and future requirements are so imperative that it is and will continue to be necessary to utilize all of our available ocean tonnage suitable for that purpose with the result that our coastwise trade will suffer great inconvenience and loss unless we utilize all of the available tonnage, whether domestic or foreign, to meet our requirements.

There is no purpose in the legislation to break down our coastwise laws or depart from a policy that has been consistently followed from the foundation of the Government, and all fears expressed to that effect are without foundation.

This legislation was adopted without reference to the soundness or unsoundness of the policy heretofore followed of reserving our coastwise trade for American-built vessels; or whether or not the extension of our coastwise laws to Porto Rico and the Hawaiian Islands is wise or unwise.

This is a war measure and is limited to the period of the war and a reasonable time thereafter; and the powers vested in the Shipping Board are so hedged about and limited that there need be no occasion for fear on the part of the interests that have enjoyed the monopoly of our coastwise trade in the past that they will suffer. They in common with all other patriotic American citizens are called upon to view the problem from the standpoint of public interest and not from the standpoint of private gain.

There can be no ground for fear from the standpoint of our shipbuilding industry. Never in the history of the world has any nation embarked on such a gigantic shipbuilding program. Not only are our existing shipyards crowded to capacity with new work but large sums are being expended both by the Government and private interests in providing new plants for the construction of merchant vessels to replace the losses occasioned by the German submarines, and with the definite purpose of making that method of warfare hopeless as a means of Germany winning the war.

The Shipping Board laid before Congress a complete report of the tonnage under the American flag now engaged in the foreign trade and the tonnage withdrawn from the coastwise trade on the Great Lakes and on our seaboads to meet the requirements mentioned above.

At the end of the fiscal year 1914, and just before the war broke out, we had registered under the American flag and engaged in the foreign trade 1,076,000 gross tons. We had on the Great Lakes 2,882,000 gross tons; and on the high seas and rivers we had 3,969,000 gross tons; in all 7,928,000 gross tons.

At the end of the fiscal year ending June 30, 1917, our shipping registered for the foreign trade has increased from 1,076,000 gross tons on June 30, 1914, to 2,422,000 gross tons; or nearly two and one-half times.

Our shipping on the Great Lakes has dropped from 2,882,000 gross tons to 2,771,000 gross tons; that is, a little over 100,000 gross tons. But it is fair to assume that more than 100,000 gross tons of shipping has been

withdrawn from the Great Lakes, because we know that there has been considerable tonnage built on the Great Lakes during that period.

On the seaboads in the coastwise trade our tonnage has fallen from 3,969,000 gross tons to 3,607,000 gross tons; a decline of about 362,000 gross tons, or 10 per cent. These are the figures covering the period up to June 30 of this year.

Prior to that time practically no ships had been taken out of the coastwise trade for military purposes. Since then the withdrawal of shipping from the coastwise trade to carry troops and munitions and supplies of every kind to meet the requirements of our Army and Navy has been very rapid, and it is probable that in a relatively short time 1,000,000 or more tons of shipping must be withdrawn from the coastwise trade to meet the requirements of the military operations of the United States.

The Shipping Board is planning between now and the close of navigation to withdraw from the Great Lakes all the tonnage that can possibly come through the Welland Canal that may be serviceable in the coastwise trade; estimated at over 300,000 gross tons.

The Canadian Government by order-in-council is now permitting American registered boats to engage in the trade between port and port on the Great Lakes, and this arrangement should be reciprocal in the present emergency in the interest of the trade of both countries.

McKinley Memorial Dedicated

YOUNGSTOWN, OHIO, Oct. 8.—Seventy thousand people witnessed the dedication Friday, Oct. 5, at Niles, of the beautiful McKinley Memorial building, erected in honor of William McKinley. The principal speakers were former President William Howard Taft, George B. Cortelyou, Myron T. Herrick, J. Mitchell Chapple, Dr. C. A. Manchester of Canton, at one time McKinley's pastor, and Joseph G. Butler, Jr., president of the McKinley Birthplace Memorial Association. The building and grounds represent an investment of half a million dollars, raised by popular subscription. In addition an endowment fund of \$100,000 is being raised for maintenance.

In addition to a 12-foot statue of McKinley, sculptured by J. Massey Rhind of New York, the memorial contains busts and reliefs of men who were prominently associated with McKinley and pioneer iron and steel manufacturers of the Mahoning Valley. In the entrance to the library is a large bust of H. C. Frick, who donated \$50,000 to the project. This bust and one of Mr. Taft were donated by Mr. Butler.

Among those recognized in the building are Ohio's war governor, David Tod, who was largely interested in the iron and steel business here in its early days; Andrew Carnegie, P. C. Knox, Theodore Roosevelt, Elihu Root, M. A. Hanna, Henry W. Oliver, Justice Day, John Hay, C. H. Andrews, and James Ward. The last named was the man who built the first rolling mill in Niles 75 years ago.

The memorial project was conceived and carried to consummation largely through the efforts of Mr. Butler, who, although 77 years of age, still is very active in business and public affairs. He is now erecting an art museum in this city at a cost of a quarter of a million dollars to house his own extensive private collection.

The Anniston Steel Products Co., Birmingham, Ala., has been incorporated in Delaware with capital of \$3,000,000 to operate a plant for the production of iron, steel and manganese products. Walter M. Hood, M. P. Randall, W. R. Lloyd, C. A. Bingham and P. C. Covington, all of Birmingham, are the incorporators.

The appointment of a supervisor of metal and fibre by the Canadian Government is indicated in an Order-in-Council which also authorizes the Minister of Customs to fix the price of scrap iron and scrap steel, rags, waste and other materials of metal or of animal, vegetable or mineral fiber.

Iron and Steel Markets

TRADE PRACTICE CHANGES

Pig Iron at Same Price for Each Furnace

Recommendations in Price Fixing Program Cover Shell Steel

With the leading iron and steel makers in conference at this writing with the War Industries Board, a further announcement of agreed prices may be expected at any moment. The effort will be to settle on the upward of one hundred items, products and classifications of them, but the American Iron and Steel Institute's committee prior to leaving for Washington late yesterday afternoon had not gotten far beyond a consideration of semi-finished steel products.

What will interest the trade nearly as much as prices is the extent to which there will be a realignment of basing points and other changes in trade practices. The sweeping recommendations proposed in fixing pig iron prices at the same figure for all furnaces are conspicuously epochal. Whether finished steel will be quoted at equal figures for Chicago as well as Pittsburgh is a question; it was not, it appears, discussed at the meetings in Washington out of which came the price promulgation on Sept. 24. The effort will be made to secure a special base price for shell steel, on the ground that it introduces a very different steel mill problem from the rolling of ordinary steel rounds. The place of the jobber in the price fixing program and the status of export sales for commercial use, or under classification C, may bring out definite rulings.

Pig iron manufacturers through their representatives on the American Iron and Steel Institute committee have recommended the adoption of a uniform price at furnace, regardless of location, with differentials of the various grades in harmony with time-honored analyses but with an effort to establish uniformity in nomenclature. While it is proposed to have a uniform base price as a maximum, furnaces will be allowed to name lower prices when they wish to do so.

In addition to recommendations as to base prices and differentials to be submitted to the War Industries Board at Washington, some perplexing problems are also to be submitted. One of these is as to whether buyers of pig iron at about \$50 tide-water for export who have not been able to obtain vessels can, without violating the spirit of the agreement, sell at a higher price than the \$33 basis. Another question relates to the commissions to be allowed brokers.

The sale of about 9000 tons of Virginia iron takes all that a leading interest will have for this year, and numerous other furnace companies North and South are understood to be in a similar condition. Hence, if the new schedule extends only to Jan. 1 the tonnage of iron to be sold under it will not be large. Some furnaces in Eastern territory have indicated a willingness to sell for the first half of next year on the schedule proposed for the remainder of this year. The making up of contracts for castings has been delayed owing to the uncer-

tainty as to pig iron prices. In the Chicago district, it is estimated that melters are already covered for about 90 per cent of their pig iron requirements for this year.

New buying in steel is still negligible. With the announcements from time to time of fresh and enlarged Government building programs, the trade is coming to accept the attitude of mills in refusing further commitments for the time being, for in addition to the direct Government needs, it is recognized that the effect passes through the ramifications of the industry to the provision of plant extensions and the building of machinery and apparatus. Our pig iron production statistics have shown how difficult it is, with fuel and labor shortage, to increase the basic output, and the records of the American Iron and Steel Institute indicate so far an annual production for this year of 33,000,000 tons of rolled products, or barely 2 per cent more than for 1916.

Thus it is that cancellations of contracts have not occurred; consumers cannot discover other sources of supply. Efforts to secure readjustments of contract prices have not, however, been forsaken. Many of these expire this year, but deliveries will be spread over several months into 1918. Beyond that the orders on mill books are for definite business not subject to cancellation in the ordinary acceptance of the term.

Little interest in lower price demands is shown where the contracts cover manufactured articles already sold and against which the contracts are a protection. But concern is felt over the distance from steel mill products which the pricing program bids fair to cover. The answer of the steel producers is that in times of heavy demand prices do not fall.

One interesting development, which indicates the large part the United States must take in Russian affairs, is the mobilization of several thousand railroad experts and mechanics to supplement the depleted ranks of railroad operatives in that country. As a part of the plan the placing is expected in the next few days of 20,000 more cars for Russia. For the Government's use in France 4250 additional 60-centimeter gage cars have been bought.

The Priority Board has ordered the railroads to provide 100 per cent car supply to the Connells-ville regions.

Pittsburgh

PITTSBURGH, Oct. 9.—(By Wire)

It is possible that this week announcement will come from the President of Government prices fixed on semi-finished and finished steel products not already covered by the Government prices that came out on Monday, Sept. 24. Large steel manufacturers were in session in New York to-day (Tuesday), and probably also on Wednesday, after which their recommendations as to prices on semi-finished and finished steel products will go to the War Industries Board at Washington and then finally to the President for his approval. Nothing is known as to what prices will be recommended, but it is stated that a suggested price of \$55 on soft Bessemer and open hearth 4 x 4-in. billets has been turned down as being too high. It is

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 10. 1917.	Oct. 3. 1917.	Sept. 12. 1917.	Oct. 11. 1916.
No. 2 X, Philadelphia...	\$33.75	\$33.75	\$52.00	\$20.00
No. 2 Valley furnace...	33.00	33.00	52.00	20.00
No. 2 Southern, Cin'ti...	....	49.90	17.40	
No. 2 Birmingham, Ala...	....	47.00	14.50	
No. 2, furnace, Chicago*	....	55.00	19.00	
Basic, del'd eastern Pa...	33.75	....	50.00	20.00
Basic, Valley furnace...	33.00	33.00	48.00	20.00
Bessemer, Pittsburgh...	37.25	37.25	51.95	23.95
Malleable Bess., Ch'go*	....	55.00	19.50	
Gray forge, Pittsburgh...	32.75	....	46.95	20.45
L. S. charcoal, Chicago...	....	58.00	20.75	

Rails, Billets, etc., Per Gross Ton:

	Oct. 10. 1917.	Oct. 3. 1917.	Sept. 12. 1917.	Oct. 11. 1916.
Boss. rails, heavy, at mill	....	\$38.00	\$33.00	
O-h. rails, heavy, at mill	....	40.00	35.00	
Bess. billets, Pittsburgh...	55.00	....	65.00	45.00
O-h. billets, Pittsburgh...	55.00	....	65.00	45.00
O-h. sheet bars, P'gh...	....	75.00	45.00	
Forging billets, base, P'gh	....	100.00	69.00	
O-h. billets, Phila...	....	85.00	50.00	
Wire rods, Pittsburgh...	85.00	....	90.00	55.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia...	4.25	4.25	4.935	2.659
Iron bars, Pittsburgh...	4.75	2.60	
Iron bars, Chicago...	4.50	2.35	
Steel bars, Pittsburgh...	4.00	2.75	
Steel bars, New York...	4.195	2.919	
Tank plates, Pittsburgh...	8.00	4.00	
Tank plates, New York...	8.195	4.169	
Beams, etc., Pittsburgh...	4.00	2.75	
Beams, etc., New York...	4.445	2.869	
Steel hoops, Pittsburgh...	5.75	3.00	

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Oct. 10. 1917.	Oct. 3. 1917.	Sept. 12. 1917.	Oct. 11. 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	8.50	3.10
Sheets, galv., No. 28, P'gh	10.00	4.25
Wire nails, Pittsburgh...	4.00	2.60
Cut nails, Pittsburgh...	4.65	2.60
Fence wire, base, P'gh...	3.95	2.55
Barb wire, galv., P'gh...	4.85	3.45

Old Materials, Per Gross Ton:

Iron rails, Chicago...	\$36.00	\$36.00	\$44.50	\$20.00
Iron rails, Philadelphia...	38.00	43.00	45.00	21.00
Carwheels, Chicago...	27.00	27.00	23.50	12.50
Carwheels, Philadelphia...	29.00	29.00	32.00	15.50
Heavy steel scrap, P'gh...	30.00	33.00	33.00	18.00
Heavy steel scrap, Phila...	25.00	25.00	30.00	15.50
Heavy steel scrap, Ch'go...	26.00	27.00	33.00	16.50
No. 1 cast, Pittsburgh...	29.00	30.00	30.00	16.00
No. 1 cast, Philadelphia...	28.00	28.00	32.00	16.00
No. 1 cast, Ch'go (net ton)	21.00	21.00	24.00	13.25
No. 1 RR. wrot. Phila...	38.00	43.00	45.00	22.00
No. 1 RR. wrot, Ch'go (net)	27.00	30.00	36.00	17.50

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt...	....	\$6.00	\$13.00	\$4.25
Furnace coke, future...	....	6.00	10.00	3.25
Foundry coke, prompt...	....	....	14.00	3.50
Foundry coke, future...	....	....	12.50	4.00

Metals,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York...	23.50	23.50	25.50	28.50
Electrolytic copper, N. Y.	23.50	23.50	25.50	28.50
Spelter, St. Louis...	8.00	8.12 1/2	8.00	9.50
Spelter, New York...	8.25	8.37 1/2	8.25	9.75
Lead, St. Louis...	7.45	7.82 1/2	9.50	6.85
Lead, New York...	7.60	7.95	9.70	7.00
Tin, New York...	61.00	60.50	61.37 1/2	42.75
Antimony (Asiatic), N. Y.	15.00	15.00	14.50	11.50
Tinplate, 100-lb. box P'gh.	....	....	\$12.00	\$6.00

further stated that it is the idea of the War Industries Board that the price of billets should not be fixed at above \$45, with a differential, of \$1 or possibly \$2, over this price in favor of sheet bars. While the steel conferences are on in New York, and to be taken up later this week in Washington, new buying in the steel trade has halted, and very little new business is being placed. So far, there has been very little done in the way of selling pig iron at the prices given out two weeks ago by the Government, and this also applies on plates, shapes and bars, the mills being filled up for months ahead on contracts and not actively seeking new business. On some contracts for coke that were on a day-to-day price basis, large shipments have been made to blast furnaces at the \$6 price, which is \$2 to \$3 per ton lower than contracts that were placed a week or two before the Government price of \$6 was announced. In regard to foundry coke, it has been determined that the usual differential in favor of this grade shall continue, and this will seem to leave manufacturers of coke free to sell foundry at 75c. to \$1 per ton higher than the price of \$6 for furnace. This is only tentative, and the actual differential in favor of foundry coke over furnace is yet to be worked out. All prices on iron and steel products remain practically the same as were in force before the Government prices were announced, on such products as were not covered by the Government prices. Consumers are waiting anxiously for announcement of the Government prices on semi-finished and finished steel products, which it is hoped will come out this week. A very decided shortage in the coal supply exists in Pittsburgh and Valley districts, and this is keeping down output of pig iron, semi-finished steel and finished steel to a very great extent. There is also a great shortage in labor, and this is getting more acute as the drafted men are leaving every day for the training camps. Office and mill forces are seriously crippled and the steel business is being carried on under great difficulties.

Pig Iron.—New inquiry for pig iron is light, and

sales have been very few. One sale of 1000 tons of Bessemer for delivery over the remainder of the year is reported at \$36.30, Valley furnace, subject to revision after Jan. 1, on any unshipped portion of iron, and there has also been a sale of 3000 tons of basic for October shipment at \$33, at furnace. It is reported that several sales of low phosphorus iron have been made at \$45, and even less, at furnace. It is believed that possibly this week the differentials to apply on the different qualities of pig iron over the \$33 price for basic and No. 2 foundry will be given out. We now quote as follows: Basic pig iron, \$33; Bessemer, \$36.30; gray forge, \$32; No. 2 foundry, \$33; No. 3 foundry, \$32.50, and malleable Bessemer, \$33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—Announcement is expected from Washington this week of the Government price on billets and sheet bars, and it is stated that the price of billets may be as low as \$45, Pittsburgh, with \$1 or \$2 per ton differential over this price in favor of sheet bars. It is stated that a recommendation made recently to the War Munitions Board that the price of billets be fixed at \$55, Pittsburgh, was not favorably received. In the meantime, the local market on soft Bessemer and open hearth billets is steadily declining, and we note a sale of about 1500 tons made last week at \$60, and a later sale of 1000 tons at \$55, Pittsburgh, for October delivery. Prices on forging billets are also lower. We now quote soft Bessemer and open hearth billets at \$55; soft Bessemer and open hearth sheet bars at about \$60, but the latter price is tentative, as we have not heard of any sales in this district for some time. Prices on forging billets are nominally \$80 to \$85 with no recent sales reported.

Ferroalloys.—There is no new buying in ferroalloys and probably there will not be until the announcement expected this week from the Government on price of semi-finished and finished steel products has come out. Whether ferromanganese and Bessemer ferrosilicon

prices will be fixed by the Government is not known at this writing, but it is expected they will be with the other products. In the absence of sales, we quote 80 per cent ferromanganese for prompt shipment at \$375 and for delivery in first half of 1918, \$350 per gross ton at furnace. These are purely nominal prices, as there is no new buying and will not be until it is definitely known whether the Government will fix prices on these products. We quote nominally 18 to 22 per cent spiegeleisen at \$80 to \$82.50 per gross ton delivered.

We quote 9 per cent Bessemer ferrosilicon at \$89. 10 per cent \$90. 11 per cent \$95. 12 per cent \$100. 13 per cent \$105. 14 per cent \$115. 15 per cent \$125, and 16 per cent \$135. We now quote 7 per cent silvery iron at \$79 to \$84. 8 per cent \$80 to \$85. 9 per cent \$81 to \$86. 10 per cent \$82 to \$87. 11 and 12 per cent \$83 to \$88. All prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of \$2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—We are not advised of any new buying of either standard sections of light rails, and prices quoted on light rails are purely nominal in the absence of new business. Such prices of light rails and regular prices on standard sections are given on page 907.

Structural Material.—So far as we are advised, there have been no sales of structural shapes by the two local mills on new orders to domestic consumers at the Government price of 3c. per lb., but orders are being placed by the Government and accepted by the mills at that price. Local fabricators say they are filled up for months ahead, and are not actively bidding on new work. The Blaw-Knox Co., of this city, will make very large extensions to its structural steel plant at Hoboken, Pa. Prices to others than the Government are found on page 907.

Plates.—Local mills say they are filled up for months ahead on plates, and have not as yet entered any orders at the Government prices of 3.25c. per lb. for delivery to domestic consumers but are filling large Government orders at that price. Prices which were formerly quoted were 8c. to 9c. for $\frac{1}{4}$ in. and heavier sheared plates, f.o.b. at mill, Pittsburgh. It is stated that no new business has been done recently by the mills at these prices, since the Government price of 3.25c. came out, and the mills also claim they have not yet sold at the Government price.

Sheets.—It is expected that possibly this week, the Government may announce its prices on sheets, but this will depend largely on the progress made at the meetings of the steel interests in session in New York this week. It is expected that after the meetings in New York have been finished, the steel men will adjourn to Washington to go into conference with Government officials on the new sheet prices. In the meantime, very little new buying is being done, consumers placing orders only for such quantities of sheets as they absolutely need. About the only new buying is coming from the Government, which is placing very heavy orders for blue annealed, black and galvanized sheets, which the mills are filling very promptly and shipping out about as fast as they are rolled, the Government orders having priority. No figures are being given out as to the Government orders for sheets being placed, but they are known to be very heavy, and are on the basis of the tentative price fixed some time ago by the Government and the mills on the basis of 6.25c. for blue annealed; 6.50c. for Bessemer black, and 8.50c. for galvanized, all of No. 28 gage. Prices to the domestic trade are holding fairly firm in the absence of large buying, and are given in detail on page 907.

Tin Plate.—As yet, nothing is known as to the prices of tin plate that will be fixed for 1918 delivery by the Government and the tin plate mills, but it will probably be given out late this month or early in November. The Government has asked that the price of tin plate be not fixed until about Nov. 1, so that it will hardly come out before that time. It is likely, but not definitely known, that the new prices will be fixed in conference between the Food Administration Board and the tin plate manufacturers. Very little tin plate is being sold on new orders. The output of the mills is under contract for all of this year and some of the

larger mills have obligations on their books that will take their entire output up to April of next year. On the small orders being placed primes are quoted at \$12 to \$14 per base box from stock. Prices on terne plates are given on page 907.

Hoops and Bands.—Very few new orders are being placed, the large consumers being covered on contracts made some months ago, and specifications are fairly heavy. We quote steel hoops in small lots at about 5c. to 5.50c. and on steel bands 5c. to 5.25c., extras on the latter as per the steel bar card.

Wire Rods.—Mills report heavy export demand from Canada and Japan and other foreign countries, and sales of soft Bessemer and open hearth rods have been made lately for export at \$85 to \$90 per ton at mill. One lot of 2000 tons of soft open hearth rods is said to have been bought lately for delivery to Canada at \$92 at mill. Domestic demand for rods is quiet, but several of the local makers say their output of rods for the remainder of this year is under contract. A recent sale of 150 tons of high carbon rods was made at \$110, maker's mill. Prices on rods to domestic consumers are given on page 907.

Wire Products.—Nothing is known here of a reported embargo on wire products said to have been declared a few days ago by the American Steel & Wire Co. It is a fact that extreme caution is being used by that concern in the distribution of its products, but it is officially denied that any actual embargo has been declared. It is expected by the trade that the Government will fix prices of wire nails and wire somewhere between the price of the American Steel & Wire Co., which is \$3.20 for wire nails and \$3.25 for bright basic wire, and that of the independent mills which is \$4 for wire nails and \$4.05 for bright basic wire. Probably wire nails will be put at \$3.60 or even \$3.75, base, per keg. The new demand for wire and wire nails is very quiet, the trade holding off buying in the belief that prices will be lower before long. Specifications against contracts are only fairly heavy. Prices of the independent mills of nails and wire to domestic consumers, but which now are largely nominal, are given on page 907, prices of American Steel & Wire Co. being \$16 per ton lower.

Iron and Steel Bars.—As yet we are not advised of any new business in steel bars at the new price of 2.90c. at mill as recently fixed by the Government. In fact, there has been practically no new buying in either iron or steel bars for some time, nor will there be until the present puzzling condition as to prices has been cleared up. Mills rolling steel bars state they have obligations on their books at the former price that will take their entire output for some months to come. Under the above conditions, we can only quote the prices in effect for some time on iron and steel bars, to domestic consumers, which are printed on page 907. These prices are largely nominal, and probably would not be paid by consumers on new orders.

Shafting.—It is not known as yet whether the Government will fix the price on shafting, but the belief is that it will. The Government has been a very heavy buyer of shafting for various equipment for war purposes, at prices somewhat lower than are ruling to the domestic trade. There is no new buying, but makers report that specifications against contracts are fairly heavy. For the domestic trade, discounts on shafting remain nominally at 10 to 5 per cent off list, prices to the Government being considerably lower.

Railroad Spikes and Track Bolts.—Practically no new orders are being placed, consumers holding off until it is known whether the Government will fix the price on spikes and track bolts with the other steel commodities. It is the belief that prices on both spikes and track bolts will be lower, in sympathy with the other steel products, even should the Government not fix the price. Nominal prices on spikes and track bolts to domestic consumers are given on page 907. Prices on direct and indirect Government orders are somewhat lower.

Nuts and Bolts.—The recent change in discount in bolts, it is said by the manufacturers, is in the nature of a readjustment, the former price on bolts having been out of line with those on nuts. New buying is

reported fairly heavy, and discounts, as given on page 907, are said by the makers to be fairly maintained.

Cold Rolled Strip Steel.—It is expected that the Government may fix the price of cold rolled strip steel and on a somewhat lower basis than is now ruling, and as a result consumers are holding off as much as possible in placing new orders. Specifications against contracts made sometime ago are fairly heavy.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms at 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—There is no new buying in rivets, nor is there likely to be until it is known whether the Government will fix prices on this product, and this information may be forthcoming in the latter part of this week. We repeat nominal prices on rivets of \$5.25 for structural and \$5.35 for cone-head boiler rivets, per 100 pounds, f.o.b. Pittsburgh. Large quantities of rivets are being furnished to the Government at a lower price.

Wrought Pipe.—While it is expected that the Government will fix prices on wrought iron and steel pipe, it is not believed that these prices will be much, if any, lower than have been quoted by the leading interests for some months. The trade does not expect that the Government will fix higher prices than have been quoted by such interests and it is also recognized that prices on iron and steel pipe of some of the independent mills have been low, when increased cost of labor and steel is considered. Discounts on iron and steel pipe as quoted by the independent mills, prices of the National Tube Co. being considerably lower, are given on page 907.

Boiler Tubes.—Should the Government fix prices on boiler tubes, it is expected they will be much lower than those in effect by the leading independent makers for some months. Nominal discounts, which give prices much lower than have been actually ruling for some time, are given on page 907.

Coke.—We cannot learn that any large direct sales or contracts for furnace coke have been made since the Government established its price of \$6 per net ton at oven for furnace coke. However, some large consumers who were buying coke at a price fixed from day to day have been getting their coke since Sept. 24 on the basis of \$6 per net ton at oven. This price is \$2 to \$2.50 lower than the prices at which contracts were made, just before the Government fixed the \$6 price. It is now learned that the Government will recognize the standard differential in favor of foundry coke over furnace, and the coke operators are to be allowed to charge it. This differential runs from 75c. to \$1 per ton, and we therefore quote foundry coke \$1 per ton higher than furnace, the price quoted being a tentative one subject to revision after Jan. 1. We quote best grades of furnace coke for prompt shipment and on contracts at \$6 per net ton, and best grades of 72 hour foundry at \$7 per net ton at oven, but it should be thoroughly understood that the latter is a tentative price. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending Sept. 29, as 347,408 tons, a decrease over the previous week of 7,694 tons.

Old Material.—Several leading scrap dealers here say they have positive information that the Government is now considering the matter of regulating prices on scrap of all kinds, and it is expected to announce the official prices to be charged by dealers to consumers within a short time. This information is also in possession of leading consumers of scrap, with the result that they are holding off placing orders, believing that the Government, should it fix prices on scrap, will probably name prices somewhat lower than are ruling now. Only a minimum amount of scrap is being sold by dealers to consumers, not enough to definitely fix prices. Forced sales of scrap already loaded in cars have been made at very low prices. In the meantime, the whole scrap market is weak, and prices on all grades are from \$1 to \$3 per ton lower. The decline in prices has been mostly in scrap used for open hearth steel purposes, such as heavy melting steel, borings and turnings. On some grades, notably low phosphorus melting stock, prices are holding fairly steady. In the absence

of definite sales on which to base quotations, dealers are quoting for delivery in Pittsburgh, and other consuming points that take Pittsburgh freight rates per gross ton as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland, and Pittsburgh, delivered	\$30.00 to \$31.00
No. 1 foundry cast	29.00 to 30.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	33.00 to 34.00
Hydraulic compressed sheet scrap	24.00 to 25.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	22.00 to 23.00
Bundled sheet stamping scrap	20.00 to 21.00
No. 1 railroad malleable stock	25.00 to 26.00
Railroad grate bars	17.00 to 18.00
Low phosphorus melting stock	40.00 to 42.00
Iron car axles	43.00 to 45.00
Steel car axles	43.00 to 45.00
Locomotive axles, steel	50.00 to 52.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	19.00 to 20.00
Cast iron wheels	30.00 to 31.00
Rolled steel wheels	34.00 to 35.00
*Sheet bar crop ends	35.00 to 36.00
Cast iron borings	20.00 to 21.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Oct. 8.

In the opinion of some of the most important in the steel trade, the situation is more mixed than ever, and certainly the problems seem as many and as complex as they were a week or two weeks ago, yet with the passing of every day a solution of the tangle is nearer. As a rule, consumers are more inclined to wait patiently, which is all they can do—although, were it not for the priority regulations and the limitation of prices on plates, shapes and bars, considerable business would be done. Consumers have expressed a willingness to pay up to 8c. for plates, it not being the price, but the delivery, that counts with them. In these products, however, the mills declare they are sold up for the remainder of the year and longer, and only those with priority certificates, indicating they are serving the Government, are obtaining materials at the new levels of 3.25c. for plates, 3c. for shapes and 2.90c. for bars. A goodly volume of export business is being turned down because the mills cannot ship this year. Sales of specialties, such as axles, tubes, etc., are going forward at a good rate, the purchasers appearing to fear that if they delay they may be placed in the present position of users of plates, shapes and bars. Innumerable questions continue to be asked in every branch of the industry, with the pig-iron trade particularly in doubt as to what it can and cannot do. The opinion is expressed that the wants of those who need pig iron this year may be helped out by a diversion of the surplus which some consumers find they have, in which connection arises the question as to whether this resale iron may be sold at more than \$33. At the latter price, no sales are definitely reported, although it is everywhere admitted that the Government price must ultimately prevail. As for the producers, it can only be reiterated they are so completely booked with orders for the next few months that they have no price at all. The silveries, low phosphorus, charcoal, etc., await further price fixing.

Opinion differs as to the working out of the priority arrangement of the Government with regard to deliveries, some statements being of a pessimistic character, while others believe that good will result from the Government knowing the hand of every mill. In a statement issued by a steel mill to its customers appears the following:

We are in receipt of instructions from the Government which will require us to report to it all orders on our books for certain commodities at the close of business Sept. 29, and with notice that similar reports covering all other commodities produced by us will be called for as rapidly as the subjects can be organized and handled.

All orders of every description shall be included in the report. Included under United States Government orders shall be all orders direct from the Government and all orders for material to be furnished sub-contractors on direct Government orders. Based on the information in the hands of the Government officials, priority orders will be issued by the Govern-

ment. * * * Whatever material of every description you have ordered from us that is on direct Government orders placed with you, or is for Government account applicable to orders placed by the Government with others for whom you are producing any articles or parts, should be separated from your ordinary commercial business. Notice should be given us of such order or orders complete and promptly.

That those in classes A and B under the priority regulation will fare well is undoubted; they must, for their work is part of fighting the war. The disturbing question is, what of those in class C, representing the ordinary industries of peace. The question is answered only by other questions, coupled with suppositions. The quotations for cast-iron pipe have been lowered \$15 per ton by the leading maker. Price announcements on sheets are expected this week, and, within a few days, official prices on old material. The market for the latter is practically dormant.

Pig Iron.—The trade continues to devote most of its time to conjecture and interrogation. It is quite generally conceded that furnaces will not have much, if any, iron which they can sell at \$33 for delivery in the remainder of this year, but it is pretty thoroughly understood that whatever iron may come to hand for disposal will not be sold at over \$33. Though it is estimated that melters are at least 90 per cent covered for this year, there is fair inquiry which, sooner or later, must be satisfied. This will be done, presumably, through the distribution of surplus iron which consumers cannot use, and, to some extent, through a revision of deliveries. Already instances are coming to light where consumers are offering their surplus to dealers for placement elsewhere. How much will be offered in this manner is an unknown quantity, while the dealers are puzzled over the matter of price. Most of them assert they would not think of touching iron for which more than \$33, furnace, is wanted, though others are speculating as to what license they have in this direction. A report is heard that 300 tons was placed in Chicago at \$33, but definite details are lacking. Orders for the Government, direct or indirect, are being filled at the new price, such orders being given priority and operating to postpone deliveries in other directions. It is admitted that the Government cannot be opposed, at the same time declared that no one wants to pursue that course. An experienced iron man expresses the opinion that the situation will be straightened out before long. Incidentally, he declares himself to be one of those who do not believe there will be any pronounced shortage. The silveries, low phosphorus, charcoal and other grades are awaiting the official fixing of their prices. The large producers, both North and South, reiterate they have no prices except for Government business. Appeals made in behalf of old customers have brought no relief. A Rockford, Ill., consumer reported a week ago as having purchased two cars of resale Southern iron at \$33, Birmingham, has since denied that he got the iron. The quotations below are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, Nos. 1 to 4.....	\$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special.....	†60.50
Northern coke foundry, No. 1.....	*33.50
Northern coke foundry, No. 2.....	*33.00
Northern coke foundry, No. 3.....	*32.50
Northern high-phosphorus foundry.....	*33.00
Southern coke, No. 1 f'dry and 1 soft.....	*53.00
Southern coke, No. 2 f'dry and 2 soft.....	*52.00
Malleable Bessemer	*33.00
Basic	*33.00
Low-phosphorus	*85.00 to 90.00
Silvery, 8 per cent.....	†77.50 to 82.50

*In accordance with the price agreed on, but nominal.
†Not yet changed, but new prices pending.

Ferroalloys.—Eighty per cent ferromanganese is easier, the representative of a large domestic producer quoting \$325 for the remainder of this year, or first quarter of next.

Plates.—Material for Government work has been booked at the Government price—3.25c.—one such order being for 2000 tons. Some users of plates have made known their willingness to pay up to 8c., but they have been unable to get them at any price inasmuch as they did not have Government backing. Some

increment to the volume of plates available comes from the embargo on exports, but still the supply falls far short of what is wanted in view of the sold-up condition of the mills, some of which are fully booked into next year. The representative of an Ohio mill which, prior to the price announcement, was placing narrow plates to a limited degree, now must submit all inquiries to the mill. The crux of the present situation is that buyers cannot at this time obtain plates unless the material is directly or indirectly for war work. Jobbers adhere to their price.

For Chicago delivery out of stock jobbers quote 10c.

Shapes.—The mills have all they can handle this year and, except where the Government is involved, business is not being taken at the official price—3c. Only two structural lettings are announced, one of them being obviously for war purposes. The Stupp Bros. Bridge & Iron Co. will supply 712 tons required for 21 storehouses for the Rock Island Arsenal, Rock Island, Ill. Joseph Rothe will supply 224 tons required in the erection of a factory for the Oneida Motor Truck Co., Green Bay, Wis.

For material out of warehouse jobbers continue to quote 5c.

Bars.—Sales of mild steel bars required for Government purposes have been made at 2.90c., Chicago, but as a general thing the bar business has been slow. With bars the mills are in much the same position as with plates and shapes. A leading maker of rail carbon bars asserts he is filled with orders to the second quarter of next year. But little business has been done in hard bars, the nominal quotations for which range from 4.25c. to 4.50c., Chicago. Bar iron has been inactive, the price being unchanged at 4.50c., Chicago. The warehouses have made no changes in their quotations.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—There is a wide range of prices for blue annealed and black sheets; in fact, prices may be said to be erratic. Quotations are difficult to procure, but they are covered by the ranges of 8.189c. to 8.689c., Chicago, for No. 10 blue annealed, and 8.189c. to 9.189c. for No. 28 black. No. 28 galvanized are about 9.689c., Chicago. A leading producer wants more sheet business. It now has 15 mills running, out of a total of 17. Jobbers have made no changes.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Wire Products.—The leading maker reports no change. Such business as it takes is on the basis of \$3.20, Pittsburgh, for nails. Its customers, in many cases, are admittedly not getting all they want, whether against new orders or specifications against contracts. Entirely new customers are sometimes not accommodated at all. The independent mills continue to quote \$4 for nails, and in many instances are serving those whom the larger interest cannot supply. We quote on the basis of \$4, Pittsburgh, per 100 lb. for nails to jobbers, as follows:

Plain fence wire, Nos. 6 to 9, base, \$4.189; wire nails, \$4.189; painted Barb wire, \$4.339; galvanized Barb wire, \$5.039; polished staples, \$4.339; galvanized staples, \$5.039; all Chicago, carload lots.

Rails and Track Supplies.—No inquiries are coming out, and the market is entirely nominal. Rail deliveries are backward, but from some source the railroads must soon have rails if they are to maintain safety and their standards of operation. We quote:

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c. base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, \$70 to \$90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, \$38, base (nominal); open hearth, \$40 (nominal); light rails, 25 to 45 lb., \$70; 16 to 20 lb., \$71; 12 lb., \$72; 8 lb., \$73; angle bars, 3.25c., base.

Bolts and Nuts.—The market continues a waiting one, many consumers apparently being of the belief they will be able to buy cheaper at a later date. They will, if they wait long enough, but the indications are that they must wait longer than they can well afford, and meanwhile requirements are piling up. The makers

are not getting raw materials any cheaper. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 907.

Cast-Iron Pipe.—The leading maker has reduced quotations \$15 per ton, following the lower quotation for pig iron, the new price allowing about \$12 for conversion. The reduction is presumably effected to stimulate business. St. Cloud, Minn., received two bids on 275 tons, but is undecided. Minneapolis, Minn., placed 150 tons with the Hammond-Byrd Iron Co., representing the National Cast Iron Pipe Co. The new quotations follow:

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., \$53.50; 6 in. and larger, \$50.50, with \$1 extra for class A water pipe and gas pipe.

Old Material.—It is predicted in an authoritative direction that Government prices for old material will be announced inside of ten days. Several dealers were in conference at Washington last week. Not much is reported of the deliberations at the capital, but it is said \$30 was suggested as a fair price for heavy melting steel. It is expected, however, that a lower price will be fixed.

The railroad lists continue small, not because the roads are unwilling to let scrap go at present prices but because of difficulty in assembling. Lists have been issued by the St. Paul, Rock Island, Pere Marquette, Big Four, Northern Pacific and Illinois Central railroads. The Illinois Central asks buyers to accept scrap in any kind of car which can be found for loading. Except for occasional transactions where a consumer or dealer is in great need, the market is at a standstill. The few sales hardly make the market, and the best quotations that can be given are those supplied by dealers. In last week's market old carwheels should have been quoted at \$27 to \$28 and stove plate at \$17 to \$18. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	\$36.00 to \$37.00
Relaying rails	50.00 to 55.00
Old carwheels	27.00 to 28.00
Old steel rails, rerolling	35.00 to 36.00
Old steel rails, less than 3 ft.	34.00 to 35.00
Heavy melting steel scrap	26.00 to 27.00
Frogs, switches and guards, cut apart	26.00 to 27.00
Shoveling steel	23.00 to 24.00
Steel axle turnings	19.00 to 20.00

Per Net Ton

Iron angles and splice bars	\$34.00 to \$35.00
Iron arch bars and transoms	38.00 to 39.00
Steel angle bars	24.00 to 25.00
Iro near axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	27.00 to 28.00
No. 2 railroad wrought	25.00 to 26.00
Cut forge	25.00 to 26.00
Pipes and flues	19.00 to 20.00
No. 1 busheling	19.00 to 20.00
No. 2 busheling	13.00 to 14.00
Steel knuckles and couplers	31.00 to 32.00
Steel springs	35.00 to 36.00
No. 1 boilers, cut to sheets and rings	18.00 to 19.00
Boiler punchings	30.00 to 31.00
Locomotive tires, smooth	31.00 to 32.00
Machine-shop turnings	14.50 to 15.50
Cast borings	14.00 to 15.00
No. 1 cast scrap	21.00 to 22.00
Stove plate and light cast scrap	16.00 to 17.00
Grate bars	14.00 to 15.00
Brake shoes	14.00 to 15.00
Railroad malleable	26.00 to 27.00
Agricultural malleable	20.00 to 21.00
Country mixed scrap	16.00 to 17.00

Cleveland

CLEVELAND, Oct. 9.

Iron Ore.—There is more ore on Lake Erie docks than a year ago, the amount on the docks Oct. 1 being 7,727,036 gross tons, as compared with 7,230,024 on the same day a year ago. More than 1,000,000 tons was added to the ore balance on docks during September. The amount placed on docks fell off about 400,000 tons as compared with the same a year ago, but Lake shipments were over 600,000 tons greater in September, 1916, than during the past month. Lake Erie ore docks handled 34,477,097 tons of ore up to Oct. 1 as compared with 38,146,974 tons for the same period in 1916. Shipments from these docks to the interior furnaces to Oct. 1 were 26,776,923 tons as compared with 28,420,289 tons during the same time in 1916. Of the total of

9,536,152 tons shipped from upper Lake docks in September, 7,239,430 tons were received at Lake Erie ports. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, \$5.95; old range non-Bessemer, \$5.20; Mesaba Bessemer, \$5.70; Mesaba non-Bessemer, \$5.05.

Pig Iron.—With the price situation as regards differentials not yet cleared up, the market is still almost at a standstill as far as sales are concerned, but there is considerable inquiry for foundry iron, some for the last quarter, but mostly for the first half. A few additional small lot sales of foundry iron are reported at \$33 for prompt shipment, and a Cleveland consumer has bought some early shipment malleable iron at \$36.30. There is an inquiry from the southern Ohio territory for 5000 to 10,000 tons of basic iron for this year's delivery. Cleveland furnace interests and selling agencies have received reports of the differentials agreed upon by the Pig Iron Committee, but as these must be submitted to the War Industries Board before they are definitely fixed, sellers are refraining from making quotations on grades on which prices have not been established. However, the fixing of differentials will leave the price situation in respect to iron for 1918 delivery unsettled, and that is of fully as much interest to the producers at present as the differentials as very little iron is available for delivery before next year. Consumers appear willing to buy for the first half at the established price, but in view of the fact that the base prices recently agreed upon by the producers and the Government are subject to revision Jan. 1, sellers do not seem inclined to make quotations for delivery next year until there is a more definite understanding than there is at present as to what next year's prices will be. Buyers of castings are seeking to place orders on a basis of \$33 pig iron, and this presents a serious problem to foundries that have covered with first half contracts for pig iron at \$50 and higher. These foundries, however, have the advantage in that they will doubtless get their iron before their competitors who have not yet covered, but who will place contracts for the lower priced iron. It is understood that many of the furnaces that recently bought the high-priced iron took casting contracts at about the same time based on the pig iron prices then prevailing, these contracts being largely in the automobile field. The Pig Iron Committee has designated 7 per cent silicon iron instead of 8 per cent as the price base for Ohio silvers, the agreed on price of this iron being \$43 at furnace with a \$3 spread. We quote delivered Cleveland as follows, the prices, except on foundry and basic iron, being those agreed on by the Pig Iron Committee and subject to revision by the War Industries Board:

Bessemer	\$37.25
Basic	33.30
Malleable, Valley furnace	33.50*
Northern No. 2 foundry	33.30
Gray forge	32.30*
Southern No. 2 foundry	37.00*
Ohio silvery, 7 per cent silicon	44.62

Coke.—There is some inquiry for foundry coke for early shipment, but producers generally are making no quotations, claiming that they are entirely sold up. There is a possibility that some foundries will suffer from a shortage unless they are able to secure additional coke soon. In the Virginia district, producers are withholding quotations until they learn whether there is to be any differential on Virginia coke. We quote standard Connellsville furnace and foundry coke at \$6 per net ton at oven.

Finished Iron and Steel.—The iron and steel trade is still marking time awaiting the announcement of the new prices on semi-finished steel and various products. The Government demands are growing larger and the situation in respect to manufacturers not having Government requirements are daily growing worse, as Government requirements are given priority over other orders. It is probable that some manufacturers not engaged directly or indirectly in Government work will suffer seriously before long because of their inability to secure steel. The trade feels that buyers of some products, particularly of plates, at the high prices, are in a more favorable position than those who place orders at the

new Government prices, as the former will be able to get deliveries much sooner than the latter. The fact is becoming more prominent every day that it will be a long time before consumers will be able to get most lines of steel at the new prices. A fair volume of inquiry is coming out largely for bars and plates. Some of these, however, are regarded as market feelers. There is also some inquiry for billets on which mills have not quoted. A Government order for 5000 tons of bars for 3-in. shells for a Cleveland plant, held up some time ago for changes in the specifications, has been released. The Shipping Board has distributed orders for 450 of the new-type of standardized water tube boilers for the Emergency Fleet among 17 boiler manufacturers. These will require 10,000 to 12,000 tons of steel. The Government will furnish the plates and boiler tubes. An increased volume of inquiry for nails and wire has come out since the establishment of bar prices, some buyers trying to place large orders, but the leading interest is adhering to its policy of limiting jobbers to their actual requirements. The delivery situation in these lines is growing worse owing to the fact that mills are not able to keep up their maximum production because of the unsatisfactory operating conditions brought about by the railroad situation and the scarcity of coal, coke and steel. The local plate situation is unchanged, one mill continuing to take orders at 7.50c. for $\frac{1}{4}$ in. plates and 6.50c. for No. 10 light plates. Sheet buyers are holding off until prices are adjusted, and the only sales reported are small lots for immediate requirements. Mills are making some price concessions to move their stocks. We quote sheets at 7.50c. to 8c. for No. 28 black and No. 10 blue annealed, and 8c. for No. 10 galvanized. Mills continue to quote hard steel bars at 4c., but lower prices are named out of stock. Warehouse prices are 4.50c. to 5c. for steel bars and 5c. to 5.25c. for structural material.

Old Material.—The market is still in a very unsettled condition and there is practically no trading except in small lots between dealers. Both consumers and dealers are holding off waiting for the expected price adjustment. Prices are weak and the tendency is still downward. A number of quotations are largely nominal owing to the fact that no sales have been made on some of these grades since the new prices were announced on iron and steel. There is a wide range in prices quoted, particularly on heavy melting steel. One dealer bought small lots during the week at prices ranging from \$26 to \$28. Some dealers are asking as high as \$30 and a sale at \$29 is reported to a dealer for Canton delivery. Borings and turnings are lower, and busheling is very weak. Dealers' prices f.o.b. Cleveland, are as follows:

Per Gross Ton

Steel rails	\$27.00 to \$28.00
Steel rails, rerolling	40.00 to 41.00
Steel rails, under 3 ft.	31.00 to 32.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.50 to 28.50
Carwheels	27.00 to 28.00
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	23.00 to 24.00
Light bundled sheet scrap	22.00 to 23.00

Per Net Ton

Iron car axles	\$44.00 to \$45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings	16.00 to 16.75
No. 1 busheling	24.00 to 25.00
No. 1 railroad wrought	35.00 to 36.00
No. 1 cast	24.50 to 25.50
Railroad grate bars	20.00 to 20.50
Stove plate	19.50 to 20.00

Bolts, Nuts and Rivets.—There is a good volume of specifications for bolts and nuts, but there is practically no new demand. Buyers are waiting for a price adjustment, but makers declare that lower prices will be impossible for a long time because they will be unable to get 2.90c. steel. The rivet market is also almost at a standstill, although one order for about 700 tons was placed during the week by a locomotive manufacturer. Consumers generally are buying only in very small lots to piece out. Makers continue to quote recent prices, which are 5.25c. Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as

follows with the usual 5 and 10 per cent discount for round lots:

Common carriage bolts, $\frac{1}{4}$ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, $\frac{1}{4}$ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, \$1.50 off list; tapped, \$1.70 off list. Hexagon, h. p. nuts, blank, \$1.70 off; tapped, \$1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, \$1.25 off; tapped, \$1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Cincinnati

CINCINNATI, Oct. 9.—(By Wire.)

Pig Iron.—Virginia makers met last week and recommended a price of \$33, furnace, for No. 2 foundry, which is now based on the Northern analysis of 1.75 to 2.25 per cent silicon. Iron ranging from 3.25 to 6.25 silicon is advanced \$1 for each 0.50 above 3.25. A price of \$58, furnace, was recommended on cold blast charcoal iron. Within the past few days a number of small lots of Virginia No. 2 foundry iron have been sold in this territory for this year's shipment. This is the only business of any kind reported. Southern iron, as well as all grades of iron in the Hanging Rock district, are off the market entirely and this includes small lots of resale iron held in these districts. No quotations have been made and the situation is unchanged from last week's report with the exception of a larger number of inquiries out and a few of them for shipment in the last half of next year. Some Ohio silvery iron is also wanted for nearby shipment. The furnaces are withholding quotations and no sales have been booked within the past week. One large foundry, malleable and basic producer in the Hanging Rock district, whose coke supply is improving, reports an increasing production of iron, but a growing scarcity of cars for shipping it has thrown this company further behind on its deliveries. As there is no Southern or Northern iron obtainable at any prices, we are unable to quote any figures except on Virginia iron, as noted.

(By Mail)

Finished Material.—Jobbers are somewhat apprehensive about shipments due in the fourth quarter, but so far they have been coming along at a fairly satisfactory rate. There is no effort to place new contracts just now, as it is generally recognized that, even if inclined to accept them, the mills would not be able to make shipments as desired on new business, and at the same time take care of the Government's needs. The warehouse price on steel bars ranges from 4.65c. to 5c. per lb., depending largely on the quantity of the order and the differential in freight rates where outside shipments are concerned. The usual 5c. per 100 lb. is added for twisted bars. Structural shapes are now quoted at 5.15c. to 5.25c. and there is said to be a fairly good business for this time of the year. Plates are unchanged and $\frac{1}{4}$ -in. and heavier remain at 10c. and No. 10 blue annealed sheets at 10c. It is difficult to name any mill figure on black and galvanized sheets, as only nominal quotations are out and no business is being booked at the figures given, which are 8.65c. for No. 28 black and 10.65c. for No. 28 galvanized f.o.b. Cincinnati or Newport, Ky. The jobbers price on nails has about settled at \$3.80 per keg and the hardware trade, composing the largest part of the business, is buying very sparingly.

Coke.—All agencies report business at a standstill. No coke is offered for this year's shipment in any of the producing districts. Special attention is being paid to shipments on old contracts, so that there is now considerably less delay in getting the fuel forward than formerly. There is a spasmodic inquiry out for foundry coke for future delivery and small odd lots are wanted for prompt movement. It is currently reported that coke producers who have to secure an outside supply of coal are unable to make contracts at the price fixed by the Government, so that it is impossible for them to take on any future coke business that would mean acquiring an additional supply of coal from which to make the fuel wanted. Domestic coke is selling more freely locally, due to the coal shortage.

Old Material.—Prices are still going down, and quotations as given to-day are liable to further reductions before the close of the week. Relaying rails are now quoted at \$44 per gross ton, while No. 1 railroad wrought scrap is not firm at \$28 per net ton. In fact, reductions have been made on practically every grade of scrap with the exception of No. 1 machinery cast, which appears to be fairly firm at \$24 per net ton. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

<i>Per Gross Ton</i>		
Stonelined sheet scrap.....	\$18.00 to \$19.00	
Old iron rails.....	32.50 to 33.00	
Relaying rails, 50 lb. and up.....	44.00 to 44.50	
Flanging steel rails.....	33.50 to 34.00	
Heavy melting steel, scrap.....	25.00 to 25.50	
Steel rails for melting.....	25.00 to 25.50	
Old carwheels.....	25.50 to 26.00	
<i>Per Net Ton</i>		
No. 1 railroad wrought.....	\$28.00 to \$28.50	
Cast borings.....	12.50 to 13.00	
Steel turnings.....	12.50 to 13.00	
Railroad cast.....	19.00 to 19.50	
No. 1 machinery cast.....	24.00 to 24.50	
Burnt scrap.....	13.00 to 13.50	
Iron axles.....	40.00 to 40.50	
Locomotive tires (smooth inside).....	33.50 to 34.00	
Pipes and flues.....	16.00 to 16.50	
Malleable cast.....	19.50 to 20.00	
Railroad tank and sheet.....	14.50 to 15.00	

Philadelphia

PHILADELPHIA, Oct. 9.

Aside from sales of about 9000 tons of Virginia foundry iron by one company, which exhausts its available supply for this year, there was very little activity in the Philadelphia market during the past week in any commodity. This iron was sold at the prices which have been suggested by the iron producers to the committee of the American Iron and Steel Institute, and which will, in turn, be suggested by that committee to the War Industries Board. The contracts will be revised, if necessary, to meet any changes that might appear in the schedules finally adopted. Inasmuch as the tentative schedules were worked out by both producers and consumers of pig iron, after much discussion, it is considered likely here that the War Industries Board will ratify them. It is estimated here that between 12,000 and 15,000 tons of foundry iron has been sold in the East during the week, 9000 tons of this, as above mentioned, being Virginia iron and the remainder divided between eastern Pennsylvania and Buffalo furnaces. A peculiar situation has developed in the export trade as a result of misunderstanding among iron and steel consumers abroad as to the new prices. It seems to have been generally regarded abroad that the Government had fixed prices for export, aside from the war needs of our Allies, as well as for the domestic trade. This is not true, as the trade here well understands, but export brokers have had an embarrassing time explaining the situation to their clients, some of whom have gone so far as to accuse their agents of trying to extort unreasonable profits.

Pig Iron.—Producers of pig iron are now awaiting ratification by the War Industries Board of the schedule of prices agreed upon as the result of conferences between the committee of the American Iron and Steel Institute and representatives of the furnaces. These suggested prices are printed elsewhere in this issue. About 9000 tons of foundry iron have been sold by a Virginia melter at the new prices, that is \$33, furnace, for No. 2 plain, \$33.50 for No. 2X foundry and \$34.50 for No. 1X foundry. Another company sold two cars of No. 1X foundry at \$34.50, furnace. These sales were made with the understanding that the prices would be altered should a schedule different from that agreed upon for recommendation to the Government be finally adopted. A New Jersey company is inquiring for 5000 tons of basic iron for this year and a number of inquiries have been received for the first half of 1918. Sales offices are still at a loss how to handle next-year inquiries. It is reported that members of the War Industries Board, in answer to letters, have expressed their opinion that pig iron contracts for next year must be revised to meet any change that might be made Jan. 1, but melters are of the opinion that contracts made now on the basis of \$33, furnace, for delivery next year ought to be per-

mitted to stand in the same way that contracts made before the price fixing now remain in force. Apparently iron consumers would be willing to contract ahead at the present prices. Until this question is settled, they are at sea regarding their future manufacturing plans. We quote the following tentative prices at furnace (freight rate to destination must be added):

Eastern Penna. No. 2 X foundry.....	\$33.50
Eastern Penna. No. 2 plain.....	33.00
Virginia No. 2 X foundry.....	33.50
Virginia No. 2 plain.....	33.00
Basic.....	33.00

Coke.—Practically no business in coke is being done pending more definite announcement regarding Government regulation. A few cars of foundry coke were sold during the week to cover urgent needs, with the price to be whatever the Government may fix. A report has reached here from Washington that the Fuel Administration has ordered that gondola cars be diverted to the coke ovens to prevent a threatened shortage of coke at blast furnaces.

Ferroalloys.—Ferromanganese is weak and there have been few sales, these ranging from \$325 to \$350 for the 80 per cent. More talk is heard of pending price fixing, with \$300 being mentioned as a possible figure which the Government and the producers may agree upon. Spiegeleisen is also weaker, being quoted at \$70 to \$75 furnace, with sales negligible.

Rails.—A few inquiries aggregating several thousand tons, mostly for 80-lb. and 85-lb. rails, for export to the Far East, have been going the rounds during the past week.

Sheets.—With new control prices soon to be determined, there is naturally little being done in sheets. Jobbers have bought a few carloads for prompt delivery at prices about as follows: No. 10 blue annealed, 7.50c.; No. 28 black, 7.50c. to 8c.; and No. 28 galvanized, 9.50c. to 10c., Pittsburgh. Some contracts for export to Japan, on which deliveries could not be made within the time specified, have been cancelled. These buyers express a confidence which sellers do not share, that they will be able to place this business later at lower prices. A part of the cancelled orders was for blue annealed sheets sold on the basis of 8.75c., Pittsburgh, for No. 10.

Structural Material.—It has been freely intimated since the announcement of a control price for structural material that, aside from Government work, sales would probably not be made for some time except for the fabricated material, on which price fixing has not been suggested. Interest, therefore, attaches to the effort of the Stone & Webster Engineering Corporation to obtain bids for fabricating work only on 4000 tons of steel required for the new plant of the Philadelphia Electric Co., the Stone & Webster Corporation agrees to furnish the steel. Because it is doing considerable Government construction work, this company may expect to obtain desired deliveries of plain material at the new prices. A large number of fabricators in this district have been asked to bid on fabricating sections for the standardized ships which the Submarine Boat Corporation and the Lackawanna Bridge Co. will build at Newark for the Emergency Fleet Corporation. It is expected that the American International Corporation may also soon ask for bids on similar work. Licenses are now being freely granted for export of ship shapes to Japan, and several shipments have gone forward in the past week. Government orders only are being filled on the basis of 3c., Pittsburgh.

Plates.—Two small mills are commonly reported to have accepted orders for tank plates in the past week or two at 8c., Pittsburgh. Most of the mills decline to quote. Large tonnages are being specified by the Emergency Fleet Corporation, one company having just received an order for 18,000 tons. No business is reported aside from Government orders at the 3.25c. price.

Billets.—Pending the fixing of a control price, no business is being done in billets or other semi-finished steel. It is reported that \$55 has been discussed as a base price for billets, but the trade is inclined to believe that the price finally agreed upon will be nearer \$50.

Iron and Steel Bars.—A fair business in iron bars continues, with some makers inclined to make conces-

sions on desirable contracts. Leading producers adhere to a price ranging from 4.75c. to 5c., Pittsburgh, but are accepting no business beyond this year. Deliveries in many instances are from two to three months off. There is no business being done in steel bars and the new price of 2.90c., Pittsburgh, is virtually nominal.

Old Material.—Dealers expect that regulation of prices of iron and steel scrap will come as soon as schedules on new material have been finally settled. If prices are fixed too low, a real scarcity may result unless ways are found to prevent small yards from hoarding supplies. Traffic regulations which would give precedence to shipments consigned to companies engaged on work designated in the Government priority schedule as class A and class B are also expected and may make it exceedingly difficult for companies not engaged on war work to get regular supplies. The mills continue to stay out of the market, neither buying nor selling, and in the absence of transactions the prices quoted below in some instances represent the sentiment of dealers and are more or less nominal. The Pennsylvania Railroad Co. received bids last week on a list totaling about 10,000 tons, and the prices offered are reported to have been fairly high considering present conditions, but the purchasers were covering on material which they had sold some weeks ago. The Central Railroad of New Jersey will close bids on Oct. 10 on about 400 tons and the Reading will close bids on the same date for about 2000 tons. There is a good inquiry for low phosphorus heavy melting steel, but no sales are reported. We quote the following prices for deliveries in the Philadelphia district, but these prices do not in every instance represent actual sales:

No. 1 heavy melting steel.....	\$25.00 to \$28.00
Steel rails, re-rolling.....	30.00 to 35.00
Low phosphorus heavy melting.....	38.00 to 40.00
Old iron rails.....	38.00 to 40.00
Old carwheels.....	29.00 to 31.00
No. 1 railroad wrought.....	38.00 to 40.00
No. 1 forge fire.....	21.00 to 22.00
Bundled sheets.....	21.00 to 22.00
No. 2 busheling.....	15.00 to 16.00
Machine shop turnings (for blast furnace use).....	15.00 to 16.00
Machine shop turnings (for rolling mill use).....	18.00 to 19.00
Cast borings (for blast furnace use).....	15.00 to 16.00
Cast borings (clean).....	19.00 to 20.00
No. 1 cast.....	28.00 to 30.00
Grate bars.....	19.00 to 20.00
Stove plate.....	19.00 to 20.00
Railroad malleable.....	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications).....	28.00 to 30.00

San Francisco

SAN FRANCISCO, Oct. 6.

The strike of ironworkers, though covering large plants at all points about San Francisco, has had only an indirect effect on local rolling mills. The strike, moreover, is considered settled, and the men are expected to return to work within a day or two. The President's announcement of a lower scale of prices in certain iron and steel products, however, has made the situation very uncertain. Local men are unwilling to express themselves until they have had opportunity more fully to consider their position as regards eastern competition and to consider their future policies. At this moment, it is not clear whether plants situated in the East will be willing to fill orders at the new prices, or will be obliged to do so. In the matter of steel bars, it would be a difficult problem for coast rolling mills to pay the old scale of prices for raw material and sell their product according to the maximum price established by the President's proclamation, without incurring losses which might force discontinuance of operations by the weaker concerns. Dealers do not apprehend any immediate revision of prices in this market, due to the fact that there does not seem to be any provision in the agreement allowing for the cancelling of contracts already in manufacturers' hands.

Bars.—Steel bars are not in such demand as formerly, buyers having been influenced by anticipations of some revision in prices. Jobbers still quote steel bars at a base price of 6.50c., but odd lots are being offered at concessions from quotations. Local mills offer coast sizes at 4c. to 5c., in carload lots.

Structural Materials.—The high prices of structural material have prevented building operations. Nearly all business offering comes from Government sources and is handled by the representatives of Eastern mills which decline to quote except on receipt of specifications. Local fabricators are short on orders, and the prospect of price revision has caused buyers to hold away from the market.

Plates.—The shipyard strike and the embargo on exportations have reduced the pressure on jobbers of tank plates and representatives of Eastern mills. The situation in this market has been complicated by the publication of the new scale of quotations approved by the President, and buyers are awaiting further developments before placing orders.

Sheets.—Stoppage of shipments to the Orient should have placed more stocks at the service of domestic buyers, but stocks in jobbers' hands are very much depleted, and are likely to remain so until it is ascertained how the new scale of steel prices will affect sheets. Asking prices of jobbers have not changed during the last three weeks, but to-day cannot be interpreted rigidly.

Wrought Pipe.—Demand for wrought pipe has been considerably curtailed lately. Nearly all of the orders have come from the oil fields and it is doubtful whether the present demand from that quarter can be sustained unless the Government is more lenient in its views towards the oil producers. Mills have been refusing to quote prices except on definite inquiry.

Cast Iron Pipe.—The market on cast iron pipe here is very inactive. There is very little movement of tonnage with little inquiry from municipalities and corporations. The only municipal order placed lately was one of the small amount of \$3,000.

Pig Iron.—An undercurrent of instability in the pig-iron market had prevailed for a week prior to the President's announcement concerning agreed prices. Now, while dealers do not expect much decrease in the prices of pig iron, owing to the fact that most buyers have contracted far ahead, and also on account of the insistent demand, buyers do not feel assured of prices being maintained at or about the present level, and they are not in the market. Some days will elapse before the market settles down and business is resumed. The apparent impossibility of obtaining export licenses prevents the supplying of a strong Oriental demand, and some pig iron destined for Japan has been diverted to the Philippine Islands.

Coke.—Supplies of coke have been easier lately, holders having been induced to place stocks on the market, at prices ranging from \$23 to \$24, but since the publication of the new price scale arranged by the Government, there are no quotations.

Old Materials.—This market has been softening during the past week and prices have been quoted at \$27 to \$28 for heavy melting scrap, and \$30 for heavy cast iron. Indications are that with the revision of steel and pig iron prices, coupled with the embargo on exports, there will be some very material declines in this market, in the near future.

British Steel Market

Tin-Plate Business Restricted—Ferromanganese Supplies Small—Large Pig-Iron Demand

(By Cable)

LONDON, ENGLAND, Oct. 10.

There has been a big demand for Cleveland pig iron and it has been supplied liberally. The stringency in hematite iron is unrelieved. Permit restrictions are hindering business in tin plates. American wire rods are quoted at £28 to £29, c.i.f. The ferromanganese market is firm, but bare of supplies. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Ferromanganese, £45 nominal.
Ferro-silicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Birmingham

BIRMINGHAM, ALA., Oct. 9.—(By Wire).—Birmingham iron producers report no sales this week and declare the market is in a more or less unsettled condition due to the failure of the Government to settle differentials. The nominal price here to-day on pig iron is \$33 No. 2 foundry basis, f.o.b. furnace. Iron producers assert that contracts will require practically the entire make of the district up to Jan. 1.

Buffalo

BUFFALO, Oct. 8.

Pig Iron.—The market still exhibits a waiting attitude pending more definite information relative to price differentials for the various grades of iron, with a good deal of interest manifested by both sellers and buyers as to the conclusions that will be reached by the Government and the War Industries Board respecting such differential scale. Meantime, with nothing definite to govern the naming of prices, producers are not quoting, and are confining themselves to taking care of business on old contracts, being behind on deliveries, as well as being sold up for a long period ahead and having no iron to dispose of. Only a few scattering emergency orders, of small tonnage, have been taken, and in at least two or three instances such emergency orders have been booked with the understanding that prices are to be adjusted to the schedule determined by the Government when announcement of the fixed price is made. Under the circumstances no schedule of prices can be reported.

Old Material.—The meeting of the Advisory Board of the Government, officials of different steel plants and representatives of the National Scrap Iron Association at New York last week to go into the steel scrap situation and determine a base price for the different grades of scrap, has had a restraining effect on business, awaiting the conclusion of the session and the announcement of decisions. The fact that this body was in session caused a temporary break in some grades, but such trading as was done was principally between dealers. As the conference is still on, the recessions in prices may be only temporary, but consumers have stopped buying until definite prices are determined. In the meantime, railroad conditions, shortage of cars, embargoes, etc., have tended to practically suspend shipments, so that taken altogether business of the past week has been of very small volume and practically at a standstill. We quote the following tentative schedule of prices, which shows recessions of \$1.00 to \$2.00 per ton in nearly all grades, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$30.00 to \$31.50
Low phosphorus	41.00 to 42.00
No. 1 railroad wrought.....	40.00 to 41.00
No. 1 railroad and machinery cast.....	29.00 to 30.00
Iron axles.....	45.00
Steel axles.....	45.00
Carwheels.....	32.00 to 33.00
Railroad malleable.....	30.00 to 31.00
Machine shop turnings.....	17.00 to 18.00
Heavy axle turnings.....	26.00 to 27.00
Clean east borings.....	19.00 to 20.00
Iron rails.....	40.00 to 41.00
Locomotive grate bars.....	20.00 to 21.00
Stove plate.....	20.00 to 21.00
Wrought pipe.....	26.00 to 27.00
No. 1 busheling scrap.....	26.00 to 27.00
No. 2 busheling scrap.....	17.00 to 18.00
Bundled sheet stamping scrap.....	20.00 to 21.00

Finished Iron and Steel.—It is stated that numerous inquiries have been received asking if it is the intention of producers to adjust prices on existing contracts and orders to meet the Government regulation. In reply to these queries, the mills are taking the position that contracts and orders entered in good faith prior to the Governmental fixing of prices are not subject to revision; and buyers are now evidently coming to the conclusion that products contracted for prior to the Government regulation will have to be taken by them at the old contract prices. Inquiries coming into the market for miscellaneous products are being declined by the mills because of the heavier Government tonnages now being placed and the desire on the part of the mills to clean up existing orders and take care

of contracts already booked, and indications point to a considerable scarcity of class "C" steel over the fourth quarter. Sellers require documentary evidence in the matter of class "C" material which purchasers claim is to be used for Governmental purposes, as well as for classes "A" and "B". Canadian inquiry has been light for the week, and the tin plate export embargo has shut off business in that line entirely. The Kellogg Structural Steel Co., Buffalo, has received the contract for the structural steel for plant of the Cleveland Worsted Mills at Jamestown, N. Y., about 100 tons.

New York

NEW YORK, Oct. 10.

Pig Iron.—Some perplexing questions are arising in connection with the determination of details of prices to be permitted under Government control. For example, some buyers purchased considerable quantities at about \$50 for export and were unable to obtain vessels or permits and the iron has been held for some time in New York and other ports. The question is whether these buyers will be allowed to sell at the price which they paid for the iron or be required to take a heavy loss. The same question applies to melters who have more iron than they need in their yards. Another interesting question is as to whether brokers will be allowed to charge a commission. It is understood that the sentiment of the pig iron producers has crystallized in favor of allowing furnaces throughout the country to name the same maximum price, as for example, \$33 as a base price at Birmingham, Virginia, eastern Pennsylvania, Valley and any other producing point. The schedule tentatively agreed upon by pig iron representatives for submission to Washington is as follows: No. 2 pig iron, 1.75 to 2.25 per cent silicon, \$33, furnace; No. 2X, 2.25 to 2.75 per cent silicon, \$33.50; No. 1X, 2.75 to 3.25 per cent silicon, \$34.50; \$1 advance for each half of 1 per cent silicon above the percentage in No. 1X. Some iron is being placed on the basis of the Government quotation of \$33 for No. 2 foundry, subject to revision in case changes are made in the Washington schedule. Sales include a small tonnage of Alabama iron on a basis of \$33, Birmingham, for No. 2, or \$37.25, tidewater. For early delivery we quote as follows, tidewater, on those grades on which prices have been fairly established, omitting other grades for the present:

No. 2 X	\$33.75
No. 3 plain	32.75

Ferroalloys.—Ferromanganese, domestic 80 per cent, is lower. Sales of carload and small lots for early delivery have been made in the last week at \$300 and for delivery next year the same figure has been quoted. The decline of about \$50 per ton from the level of a week ago is due, in the opinion of some, to the expected fixing of a price on the alloy by the Government and the desire of some holders to get the best returns possible. Rumors are to the effect that the Government price may be put at \$200 but this is unconfirmed. The market generally is devoid of much inquiry. One representative of a British producer has heard that a license to ship 300 tons has been granted. Production in this country in September, according to the blast furnace reports of THE IRON AGE, was 23,973 gross tons which is nearly equal to the record production in August of about 24,500 tons. The spiegeleisen output in September was 18,262 or nearly double that for August. For 20 per cent spiegeleisen as low as \$75 furnace is quoted but sales and inquiries are few. A small lot is reported sold at Chicago for this year's delivery at \$75, which is about \$72 to \$73, eastern Pennsylvania furnaces. Ferrosilicon, 50 per cent, is quiet. It is understood that quotations have been advanced from a minimum of \$140 to \$150 with the range now at \$150 to \$165 but that these prices have not yet been established by sales, the advance following the large sales made a week or so ago.

Structural Material.—Some good is expected from the local movement mentioned in these pages, growing out of the activities of the Building Material Exchange

and resulting in a committee appointed by the president of Manhattan Borough on the Alleviation of Building Stagnation. Committees are at work on prices and supplies, on labor, on mortgage loans, etc.; and it is said that the atmosphere is being clarified and probably when the steel industry generally gets a new start with the wider acceptance of the fixed prices, activity in building operations may be expected. Assurances have been made freely at the meetings that structural steel at the new prices would be deliverable in New York by Jan. 15. Meanwhile new work is mainly for the Government and for railroads; J. G. White Co. asking for bids on 2000 tons for a nitrate plant and the New York Central for 500 tons of bridge work and the Pennsylvania for 600 tons. The steel for the Tacony Ordnance Corporation, 1750 tons, has been awarded to the Belmont Iron Co. No mill business has been learned of and we therefore cannot quote on mill shipments, but warehouse shapes are still quoted at 5c. to 5.50c., New York.

Steel Plates.—It is believed that some small business is being done on steel plates and in some quarters it is thought that this year shipments may be done at 5c. It is asserted that 600 tons has been bought at 6c. for shipment to the Pacific coast for storage pending licenses to send to the Orient. For the Government railroad in France 4250 cars of 60 centimeter gage have been placed, 1000 box cars each to the American Car & Foundry, the Standard Steel Car and the Pressed Steel Car companies and 800 high side gondolas to the American Car & Foundry Co. and 450 of the same kind to the Magor Car Co. An interesting development is that the 20,000 cars for Russia are probably to be placed very shortly, the assurances being more positive than usual and predicated partly on the plan to send over a large corps of those experienced in railroading comprising superintendents as well as those capable of doing car repair work. Probably several thousand all told are involved. Owing to the difficulty of establishing definitely new transactions, we are unable to quote plates out of mill, but out of store sales have been made as high as 12c., New York.

Iron and Steel Bars.—Cancellation of contracts has so far apparently not been given serious consideration by buyers, but instead they are inclined to believe they had better hold them to insure deliveries which might be exceedingly difficult to get through fresh buying with mills other than those having the existing contracts. It would appear that there are few contracts for 1918 deliveries, these being instead specific commitments, but that many covering 1917 deliveries will carry over for several months into next year. Sellers are making the point that in times of demand it is not reasonable to expect price recessions; such have always heretofore occurred with a diminishing demand, and this argument is held up to convince buyers of the wisdom of holding securely to their own contracts. It is expected that in further price fixing agreements shell steel rounds will be put on a basis different from steel bars. In bar iron a fair amount of business is reported with sustained prices. Although claims are made that some business has been done at 4.50c., Pittsburgh, basis, the conditions are too vague to regard them as fixing the market and we find it necessary not to quote at the moment for mill shipments on steel bars, but we continue to quote mill shipments of iron bars at 4.945c., New York, and from warehouse 5c. to 5.50c. for both iron and steel bars.

Old Material.—The old material market is in a demoralized condition. It is confidently expected that the Government will soon take a hand in fixing prices and some dealers believe that heavy melting steel will be selling at about \$20 per ton before long. For the most part, quotations remain unchanged, although some sales of heavy melting steel have been made at \$23.50 and the same price has been paid for a limited tonnage of No. 1 machinery cast. Steel mills, when buying at all, are doing so in a very conservative way and foundries are not making any castings except those which have been sold, as they believe that now is not the time to make castings to store for future sale. Rejections are numerous and the car situation is still very unsatisfactory.

factory. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	\$23.50 to \$25.00
Old steel rails (short lengths) or equivalent heavy steel scrap	23.50 to 25.00
Relaying rails	45.00 to 50.00
Reroiling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	\$23.50 to \$25.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	16.00 to 17.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Cast Iron Pipe.—Business is almost at a standstill, as no public lettings of importance have developed and private buying is extremely limited. Nominally prices continue at \$65.50 per net ton for 6 and 8-in. and heavier and at \$68.50 for 4-in., but a readjustment is expected to come at any time.

St. Louis

ST. LOUIS, Oct. 8.

Old Material.—Scrap continues to be practically without price, as the little buying that is being done among the dealers is of no consequence either as to quantity or as to making a market from which quotations can be determined. The figures given are estimates only of the values and it is very doubtful if any business could be done on them, either from the buying or the selling standpoint. We quote dealers' prices, with the reservation noted, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$36.00 to \$37.00
Old steel rails, re-rolling	35.00 to 35.50
Old steel rails, less than 3 feet	29.00 to 30.00
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old car wheels	24.00 to 25.00
No. 1 railroad heavy melting steel scrap	25.00 to 25.50
Heavy shoveling steel	22.00 to 22.50
Ordinary shoveling steel	19.50 to 20.00
Frogs, switches and guards cut apart	24.50 to 25.00
Ordinary bundled sheet scrap	16.00 to 16.50
Heavy axle and tire turnings	16.50 to 17.00

Per Net Ton	
Iron angle bars	\$33.50 to \$34.00
Steel angle bars	23.50 to 24.00
Iron car axles	39.50 to 40.00
Steel car axles	38.50 to 39.00
Wrought arch bars and transoms	37.50 to 38.00
No. 1 railroad wrought	28.50 to 29.00
No. 2 railroad wrought	26.50 to 27.00
Railroad springs	25.50 to 26.00
Steel couplers and knuckles	27.50 to 28.00
Locomotive tires, 42" and over, smooth inside	29.50 to 30.00
No. 1 dealers' forge	18.00 to 18.50
Cast iron borings	14.00 to 15.00
No. 1 busheling	20.50 to 21.00
No. 1 boilers, cut to sheets and rings	16.50 to 17.00
No. 1 railroad cast scrap	18.50 to 19.00
Stove plate and light cast scrap	16.50 to 17.00
Railroad malleable	25.50 to 26.00
Agricultural malleable	18.50 to 19.00
Pipes and flues	18.50 to 19.00
Heavy railroad sheet and tank scrap	15.50 to 16.00
Railroad grate bars	15.50 to 15.50
Machine shop turnings	14.50 to 15.00
Country mixed scrap	14.50 to 15.00

Pig Iron.—The market has been literally flooded with inquiries for pig iron, some for specific tonnages of moment and others for small lots, apparently for the purpose in the latter case of getting a figure out of the furnace representatives. However, very few sales and those for special lots under analyses differing from the standard grades have been made. Furnace representatives are still in the dark as to what prices they may sell for. A notable feature of the inquiries has been the fact that they came from well outside of the usual St. Louis territory as well as within it, Oklahoma, Nebraska and Kansas melters being included in the list.

Included in the inquiries out and which have the ring of real business about them is one for 20,000 tons of Southern basic, half for first quarter and half for second. Under the conditions existing no quotations can be made in this market and none reported until the details of the Government's price are worked out.

Coke.—The coke situation is much the same as that of pig iron so far as making any transactions are concerned and there are no specially important inquiries in the market with one exception, which calls for 30,000 tons of smelter coke and on which no figures have been made as yet.

Finished Iron and Steel.—In finished products mill representatives have been burdened with calls for future contracts, many of the consumers having, apparently, been of the impression that the fixing of prices also made available a supply of material. Movement out of warehouse continues to increase so far as the supplies will permit, but there is considerable difficulty in meeting the calls for material. We quote for stock out of warehouse as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 10.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black sheets, cold rolled one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Jones & Laughlin Co. Strike Settled

The strike which started about three weeks ago at the Eliza blast furnaces of the Jones & Laughlin Steel Co., at Pittsburgh, and later spread to the Soho furnaces, causing these stacks to be banked for a short time, has been settled, the men having returned to work at exactly the same terms offered by the company when the strike started. The trouble was caused by agitators of the American Federation of Labor trying to organize lodges among the men employed at the Eliza and Soho furnaces, but which was unsuccessful. Effective Oct. 1, Jones & Laughlin Steel Co. made a general advance in wages of 10 per cent at all its blast furnaces and steel works in the Pittsburgh district, also at the blast furnaces, steel works, wire mills, tin plate and pipe mills at its Aliquippa works, Aliquippa, Pa.

Experts for Machine Tool Supervision

WASHINGTON, Oct. 9.—Rear Admiral A. V. Zane, of the Priorities Committee, has been placed in general charge of all subjects relating to tools and machine tools. There is but one exception to this. Rear Admiral N. E. Mason of the same committee has charge of all questions arising in connection with tools for the manufacture of ordnance supplies for the Navy.

This delegation of the tool question to these two navy experts is important. Just now the manufacturers who will manufacture supplies for the army and navy are getting in their tools and machine tools to accomplish this work. Also it is imperative that all repairs or replacement of such tools shall be attended to at once, so that there will be no delay. As a consequence, a great number of applications are being received by the Priorities Committee for certificates to command the immediate or prior delivery of such tools to these plants. Such applications are handled by either Admiral Zane or Admiral Mason.

Ford Contract Awarded

The Henry Ford & Son Co., Detroit, has contracted with the George A. Fuller Co. for buildings to be erected on the River Rouge, Detroit. These, together with blast furnaces, coke ovens, docks, etc., will constitute the plant for the manufacture of tractors and steel for Ford automobiles. The estimated total cost of plant is \$20,000,000 and approximately \$8,000,000 of this is involved in the Fuller company's contract.

The American Bronze Co., Berwyn, Pa., maker of bearing bronzes, has changed its name to the American Bronze Corporation.

IRON AND INDUSTRIAL STOCKS

Downward Trend Continues—Railroads Make a Poor Showing

NEW YORK, Oct. 10.

The downward trend of the stock market last week was decided and was again attributed chiefly to the heavy demands of the Government in financing the war through the sale of Liberty bonds and in the levying of high taxes. The Federal Reserve Board is urging the limitation of maturity of current commercial paper to a period not to exceed four months, instead of six months, as it is thought that this change would improve present conditions. It is believed that the financial machinery of the country is able to meet the strain incident to the war loans, but that all possible assistance should be rendered by the banks and by people in general.

One of the very unfavorable features of the present situation is the poor showing of railroads. The decline in railroad securities is assuming alarming proportions and the reason is found in the great increase in expenses. For example, the New York Central in August increased its gross earnings by the sum of \$1,462,457, but the increase in expenses was \$2,798,690 and the actual loss in net earnings consequently was \$1,337,233. The Pennsylvania Railroad and other companies make equally poor reports.

Among the companies which registered declines last week were the American Locomotive, 1 point; Baldwin Locomotive, 1½; Colorado Fuel & Iron, 1%; Crucible Steel, ½; Republic Iron & Steel, common, 1½; United States Steel, common, 2. Among the very few companies which made gains were Lackawanna Steel, ½ point, and National Enameling & Stamping, ½.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	22 - 24 1/2	Gt. No. Ore. Cert.	30 1/4 - 33 1/2
Allis-Chal., pref.	76 1/2 - 78	Gulf States Steel.	91 - 97
Am. Can., com.	41 1/2 - 47 1/2	Int. Har. of N. J., com.	108 - 109
Am. Can., pref.	100 - 101 1/2	Int. Har. of N. J., pref.	112
Am. Car. & Fdry., com.	67 1/4 - 70 1/4	Int. Har. Corp., com.	68
Am. Car. & Fdry., pref.	107 7/8 - 110	Int. Har. Corp., pref.	103 1/4 - 105
Am. Loco., com.	56 1/2 - 61	Lacka. Steel	79 - 81 1/2
Am. Loco., pref.	99 1/4 - 100 1/2	Lake Sup. Corp.	15 1/2 - 16 1/2
Am. Rad., com.	292 - 305	Midvale Steel.	47 1/2 - 51 1/2
Am. Ship, com.	89 1/4 - 90 1/2	Nat.-Acme.	32 - 32 1/2
Am. Ship, pref.	93 - 94	Nat. En. & Stm., com.	42 - 46
Am. Steel Fdries.	62 - 66 1/4	N. Y. Air Brake.	118 1/2 - 122
Bald. Loco., com.	57 1/4 - 64 7/8	Pressed Steel, com.	59 1/2
Bald. Loco., pref.	98 1/2 - 99	Pressed Steel, pref.	100 1/2
Beth. Steel, com.	86 - 89	Ry. Steel Spring, com.	43 - 45
Beth. Steel, class B.	83 1/4 - 93 1/2	Republic com.	77 1/2 - 82 1/2
Beth. Steel, pref.	84 - 91	Republic pref.	99 1/2 - 100 1/2
Cambria Steel	145	Sloss, com.	40 - 42
Carbon Steel, com.	72	Superior Steel.	40 - 45
Central Fdry., com.	28 1/2 - 29	Superior Steel, 1st pref.	100
Central Fdry., pref.	44	Transue-Williams.	41
Charcoal Iron, com.	5 1/2 - 6	Un. Alloy Steel.	41 1/2 - 44
Chic. Pneu. Tool.	60	U. S. Pipe, com.	15 - 16 1/2
Colo. Fuel	39 1/2 - 43 1/2	U. S. Steel, com.	104 1/2 - 110 1/2
Cruc. Steel, com.	66 1/2 - 74 1/2	U. S. Steel, pref.	115 1/2 - 116
Cruc. Steel, pref.	91 1/2 - 95	Westing. Elec.	43 1/2 - 46 1/2
Deere & Co., pref.	99 1/2 - 100		
Gen. Electric	136 - 142		

Algoma Steel Meeting

Lake Superior Corporation stockholders at their annual meeting in Cambridge, N. J., Oct. 3, heard from official sources most encouraging reports about the outlook for their property. J. Frater Taylor, president of the Algoma Steel Corporation, the chief subsidiary, told stockholders that the Algoma plant made net earnings for the two months July and August of approximately \$1,000,000, subject to interest charges and depreciation. This means that the steel plant is now earning at the rate of more than \$5,000,000 for the current fiscal year, comparing with about \$4,000,000 earned for the fiscal year ended June 30, 1916.

Mr. Taylor also stated that the plant had been brought up to its maximum capacity of 50,000 tons of steel ingots monthly. This is all open-hearth steel and compares with a pre-war output of less than two-

thirds of that amount, of which one-half was Bessemer.

For the last fiscal year, Mr. Taylor explained, the Algoma Steel Corporation received and released cash amounting to approximately \$7,000,000, which was used as follows:

In additions to plant and equipment.....	\$2,000,000
In paying off three-year notes.....	2,400,000
In paying off mortgages.....	200,000
For additional working capital on account of increase in accounts receivable.....	700,000
For additional working capital on account of increased stock of raw materials.....	1,500,000
Deposited with trustees.....	500,000

The annual meeting was a prolonged affair, largely because a few stockholders sought to have answered a lengthy list of questions concerning the fiscal affairs of the company. Wilfred H. Cunningham, president of the Lake Superior Corporation, who presided at the meeting, told the inquiring stockholders that the questions submitted would be taken up at the next meeting of the board, and that, if possible, detailed replies would be given to each inquiry. Before this conclusion was reached, however, more than a dozen stockholders got up and aired their grievances against past management of the corporation.

The retiring directors were re-elected by a vote of 281,871 shares and R. Home Smith, representing the Algoma Central and Hudson Bay Railway Co., was added to the board.

Colorado Fuel Earnings

In the fiscal year ended June 30 last the Colorado Fuel & Iron Co., according to the annual report, earned a balance for its common stock of \$3,219,469, which is equivalent to \$9.40 a share. Gross receipts from sales were \$40,004,886, an increase of 56.1 per cent over the preceding year, while net earnings were \$3,887,232, a gain of 89 per cent. Surplus above all operating expenses and fixed charges amounted to \$6,218,057, compared with \$2,201,170 in the preceding year. Expenditures during the year for improvements and additions to property totaled \$2,846,910. The net increase in property account after allowing for book value of plants and equipment abandoned and for other small items was \$1,237,909.

J. V. Thompson Assets and Liabilities

The largest schedule of assets and liabilities in the history of the United States Court at Pittsburgh, was filed last week by J. V. Thompson in his voluntary bankruptcy petition. Mr. Thompson was formerly a large coal and coke operator in the Connellsville and Greene county districts, and was also president of the First National Bank of Uniontown, Pa., which closed its doors shortly after his failure. The schedule filed shows liabilities of \$39,368,098.11 and assets of \$57,474,593.71. The liabilities are: Taxes, \$475,000; wages, \$1,762; secured claims, \$19,870,601.24; unsecured claims, \$19,020,734.87. The largest item in the assets is real estate, appraised at \$41,204,253.01. Among the greater liabilities are single claims of the Union Trust Co. of Pittsburgh, \$1,500,000, and J. R. Nutt of Cleveland, \$1,880,000.

Industrial Finances

The State Board of Public Utility Commissioners of New Jersey has approved the merger of the United Shoe Machinery Co., capitalized at \$25,000,000, and the United Shoe Machinery Corporation, with a capital of \$50,000,000. The name of the merged company will be the United Shoe Machinery Corporation, and it will have a capital of \$50,000,000, divided into 2,000,000 shares at \$25 a share.

The stockholders of the Lansdale Foundry Co., Lansdale, Pa., have authorized the capital stock to be increased from \$25,000 to \$100,000. The output of the plant has been doubled, most of it being for the United States Government.

Within the past month the Shenango Furnace Co., Pittsburgh, operating three blast furnaces at Sharps-

ville, Pa., coal and coke works in Westmoreland County, Pa., and owner of large ore properties, has satisfied a general mortgage for \$4,000,000 on all its properties, and also a mortgage of \$2,500,000 on its Webb ore mine. The mortgage for \$4,000,000 did not become due until 1921, and the mortgage for \$2,500,000 until 1930, and both were secured by 5 per cent bonds. The \$4,000,000 mortgage was recorded in Westmoreland County, Pa., where the coal and coke properties of the company are located, and was much the largest mortgage of record ever satisfied in full in that county at one time. The Shenango Furnace Co. is absolutely free of all liabilities except its current bills.

On Oct. 1, dividend disbursements by leading steel companies in the Youngstown, Ohio, district totalled considerably over \$2,500,000. The largest dividend payers were the Youngstown Sheet & Tube Co., \$1,100,000; Brier Hill Steel Co., \$702,500; Republic Iron & Steel Co., \$437,500, and Trumbull Steel Co., about \$275,000. In addition, smaller concerns like the General Fireproofing Co., Republic Rubber Co., and others also paid dividends.

The plant of the Champion Iron Co., Kenton, Ohio, was sold by the receiver a few days ago to Robert L. Miller, Kenton. It is stated that if the sale is confirmed by the court, the plant will be operated along the same lines that it has been in the past.

The Cleveland Tractor Co., Cleveland, has been authorized by its stockholders to increase its capital stock from \$600,000 to \$6,000,000 of which \$600,000 will be issued at once. The proceeds will be used to complete a factory extension now under construction. The company, formerly known as The Cleveland Motor Plow Co., manufactures small farm tractors. It is stated that the new addition will provide a capacity of 800 tractors next year. The company reports that the demand for tractors is very heavy and a large number of orders are coming from England.

The Detroit Iron & Steel Co., Detroit, has declared an extra dividend of 5 per cent in addition to its regular dividend of 2½ per cent. The dividends will be paid on the \$1,500,000 common stock outstanding. The dividends aggregate \$112,500 and are the first to be paid on the common stocks since the company increased its capital stock by a 100 per cent stock dividend. There is also \$750,000 preferred stock.

The Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, has issued a statement showing that its sales for the year ending June 30, 1917, were \$33,066,083.48 an increase of \$11,218,047.81 over the year ending June 30, 1916. Net profits for the year ending June 30, 1917 are given as \$7,811,444.19, after setting aside \$1,507,278.58 as reserve for depreciation and depletion and \$1,823,548.16 for estimated war profits tax. In other words, the total earnings of the Pittsburgh Steel Co., for the year ending June 30, 1917, were \$11,142,270.93. The total earnings of the company for the year ending June, 1916, were \$4,564,067.18.

Dividends

The Midvale Steel & Ordnance Co., quarterly, \$1.50 per share payable Nov. 1.

The Transue & Williams Steel Forging Co., quarterly, \$1.25 per share, payable Oct. 20.

The United Alloy Steel Corporation, quarterly, \$1 per share, payable Oct. 20.

Mining Engineers Meet

The American Institute of Mining Engineers, Philip N. Moore of St. Louis, president, began its one hundred and fifteenth convention at St. Louis Monday, Oct. 8, with opening addresses, reports of the president and other officers, etc. The convention was arranged to be a moving affair, the delegates in attendance being taken to various mining districts in the vicinity of St. Louis, including the Joplin, Mo., lead and zinc area, the Miami, Okla., lead and zinc district, the Pittsburg, Kans., coal district, and possibly the Illinois coal district. The concluding session is planned for Saturday at Tulsa, Okla. Special study is to be made of all the mineral districts visited.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Nominal quotations, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in car-loads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c., minimum carload 36,000 lb.; St. Paul 35.5c., minimum carload 36,000 lb.; Denver 79c., minimum carload 36,000 lb.; Omaha 47c., minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c., minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c., minimum carload 40,000 lb. and 85c., minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. in one or both legs, $\frac{1}{4}$ in. thick and over, and zees 3 in. and over, etc.

Wire Products

(Prices of independent mills)

Wire nails, \$4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$4.65 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.95; galvanized wire, \$4.65; galvanized barb wire, and fence staples, \$4.85; painted barb wire, \$4.15; polished fence staples, \$4.15; cement-coated nails, \$3.90 base, these prices being subject to the usual advances for the smaller trade all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2 $\frac{1}{2}$ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c., and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, \$1.70 off list, and tapped, \$1.50 off; hex. blank, \$1.50 off, and tapped, \$1.30 off; nuts, c. p. c. and t. blank, \$1.25 off; and tapped, \$1 off; hex. blank, \$1.25 off, and tapped, \$1 off. Semi-finished hex. nuts 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at \$90 to \$95; high-carbon rods made from ordinary open-hearth steel \$95 to \$100, and special steel rods with carbons running from 0.40 to 0.60, \$100 to \$110 at mill; above 0.60 carbon, \$115 to \$120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, \$7.00, $\frac{1}{4}$ in., 7/16 in. and $\frac{1}{2}$ in., \$7.00 base. Boat spikes are occasionally quoted \$7 to \$8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 75c. to railroads, and 8c to 85c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on car-load and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., \$75 to \$80; 16 to 20 lb., \$80 to \$81; 12 and 14 lb., \$82 to \$83; 8 and 10 lb., \$83 to \$84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, \$28; open hearth, \$40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plates were advanced from \$2 to \$2.50 per package and are now as follows: 8-lb. coating, 200 lb., \$16 per package; 8-lb. coating, I. C., \$16.20; 12-lb. coating, I. C., \$17.50; 15-lb. coating, I. C., \$18.25; 20-lb. coating, I. C., \$19; 25-lb. coating, I. C., \$20; 30-lb. coating, I. C., \$21; 35-lb. coating, I. C., \$22; 40-lb. coating, I. C., \$23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. In carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for car-load lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Steel			Butt Weld			Iron		
Inches	Black	Galv.	Inches	Black	Galv.	Inches	Black	Galv.
$\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{8}$...	42	15 $\frac{1}{2}$	$\frac{1}{4}$ and $\frac{3}{8}$...	23	+4			
$\frac{1}{2}$...	46	31 $\frac{1}{2}$	$\frac{1}{2}$...	24	+3			
$\frac{3}{4}$ to 3...	49	35 $\frac{1}{2}$	$\frac{1}{2}$...	28	10			
			$\frac{1}{2}$ to 1 $\frac{1}{2}$...	33	17			

Lap Weld		
2...	42	29 $\frac{1}{2}$
2 $\frac{1}{2}$ to 6...	45	32 $\frac{1}{2}$
7 to 12...	42	28 $\frac{1}{2}$
13 and 14...	32 $\frac{1}{2}$	..
15...	30	..

Butt Weld, extra strong, plain ends		
$\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{8}$...	38	20 $\frac{1}{2}$
$\frac{1}{2}$...	43	30 $\frac{1}{2}$
$\frac{3}{4}$ to 1 $\frac{1}{2}$...	47	34 $\frac{1}{2}$
2 to 3...	48	35 $\frac{1}{2}$

Lap Weld, extra strong, plain ends		
2...	40	28 $\frac{1}{2}$
2 $\frac{1}{2}$ to 4...	43	31 $\frac{1}{2}$
4 to 6...	42	30 $\frac{1}{2}$
7 to 8...	38	24 $\frac{1}{2}$
9 to 12...	33	19 $\frac{1}{2}$

Standard Charcoal Iron		
1 $\frac{1}{2}$ and 2 in...	31	23
2 $\frac{1}{2}$ in...	28	15
2 $\frac{1}{2}$ and 2 $\frac{1}{2}$ in...	34	32
3 and 3 $\frac{1}{4}$ in...	34	38
3 $\frac{1}{2}$ to 4 $\frac{1}{2}$ in...	34	43
5 and 6 in...	33	37
7 to 13 in...	30	34

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than above discounts on black and 5 $\frac{1}{2}$ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		Standard Charcoal Iron	
1 $\frac{1}{2}$ and 2 in...	31	1 $\frac{1}{2}$ in...	23
2 $\frac{1}{2}$ in...	28	1 $\frac{1}{2}$ and 2 in...	15
2 $\frac{1}{2}$ and 2 $\frac{1}{2}$ in...	34	2 $\frac{1}{2}$ in...	32
3 and 3 $\frac{1}{4}$ in...	34	2 $\frac{1}{2}$ and 2 $\frac{1}{2}$ in...	38
3 $\frac{1}{2}$ to 4 $\frac{1}{2}$ in...	34	3 and 3 $\frac{1}{4}$ in...	43
5 and 6 in...	33	3 $\frac{1}{2}$ to 4 $\frac{1}{2}$ in...	No quotations
7 to 13 in...	30	5 and 6 in...	37
		7 to 13 in...	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1 $\frac{1}{2}$ in. over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows: 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, \$5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8...	8.00 to 8.50
Nos. 9 and 10...	8.25 to 8.50
Nos. 11 and 12...	8.50 to 8.75
Nos. 13 and 14...	8.75 to 9.00
Nos. 15 and 16...	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21...	8.30 to 8.80
Nos. 22 and 24...	8.35 to 8.85
Nos. 25 and 26...	8.40 to 8.90
No. 27...	8.45 to 9.00
No. 28...	8.50 to 8.95
No. 29...	8.55 to 9.05
No. 30...	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11...	8.50 to 9.00
Nos. 12 and 14...	8.60 to 9.10
Nos. 15 and 16...	8.75 to 9.25
Nos. 17 to 21...	8.90 to 9.40
Nos. 22 and 24...	9.05 to 9.55
Nos. 25 and 26...	9.20 to 9.70
No. 27...	9.35 to 9.85
No. 28...	9.50 to 10.00
No. 29...	9.75 to 10.25
No. 30...	10.00 to 10.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16...	7.80 to 8.30
Nos. 17 to 21...	7.85 to 8.35
Nos. 22 to 24...	7.90 to 8.40
Nos. 25 to 27...	7.95 to 8.45
No. 28...	8.00 to 8.50
No. 29...	8.05 to 8.55
No. 30...	8.05 to 8.55
Nos. 30 $\frac{1}{2}$ and 31...	8.10 to 8.60

Metal Markets

The Week's Prices

Oct.	Lake	Cents Per Pound for Early Delivery		Lead		Spelter	
		Copper, New York	Tin, Electro-	New York	New York	St. Louis	New York
3	23.50	23.50	60.50	7.90	7.75	8.37 1/2	8.12 1/2
4	23.50	23.50	60.75	7.85	7.70	8.37 1/2	8.12 1/2
5	23.50	23.50	60.75	7.80	7.65	8.37 1/2	8.12 1/2
6	23.50	23.50	60.75	7.80	7.65	8.25	8.00
8	23.50	23.50	61.12 1/2	7.70	7.55	8.25	8.00
9	23.50	23.50	61.00	7.60	7.45	8.25	8.00

NEW YORK, Oct. 10.

All the metals are weak and inactive except tin. The copper market is chaotic and nominal. Tin is fairly active and higher. Lead is dull and weaker. Spelter is again stagnant and nominally lower. Antimony continues unchanged.

New York

Copper.—The copper situation could hardly be more uncertain. Until yesterday all supplies had been practically commandeered by the Government and not only could no copper be sold at the Government price of 23.50c., which we continue to quote as nominal, but even deliveries on contract were forbidden until the needs of the Government and the Allies were known. It is now reported that consumers having contracts can now obtain their supplies as it is found that the combined requirements of the Government and its allies will be 120,000,000 lb. per month for the last quarter. While production in September was only 130,000,000 lb. it is believed that it will reach 200,000,000 lb. per month in the last quarter which will insure 80,000,000 lb. per month for domestic consumers; this is believed by some sufficient. The pooling committee of producers is reported as now in conference with a similar committee of consumers and a comparison of statistical data is expected to bring about a clearing of the situation. The London market is unchanged at £125 for electrolytic and £121 for futures.

Tin.—The feature of the tin market is an appreciable tightening of shipment permits, particularly from England and the Straits Settlements. The names of parties to whom tin is to be shipped are required and this may mean hardship for buyers of spot metal later. The past week has witnessed more buying than in some time. On Oct. 4 at least 300 tons of future shipment changed hands and on Oct. 5 there was again a fair business in futures, amounting probably to 200 tons. Early this week there was a good sized inquiry but sales yesterday and Monday were light and the market has become dull again. The quotation yesterday was 61c., New York. Arrivals to Oct. 9 inclusive have been 1100 tons with 5000 tons reported afloat. The London market yesterday was unchanged from last week's price of £245 10s. per ton.

Lead.—The lead market is dull, stagnant and uninteresting and shows signs of decided weakness. Demand has been as light as possible and buyers are holding off, evidently expecting lower prices fixed possibly by the Government. Sellers, however, are desirous of orders and concessions are being made to such an extent that prices have declined from 7.95c. a week ago to 7.60c., New York, yesterday and 7.45c., St. Louis. A bright spot has been considerable demand from England and Canada which appeared at the end of last week. Sales are reported to have been made of metal for November shipment at 7.50c., New York, with bids for December at 7.37 1/2c. An interesting unconfirmed report is that producers have agreed to furnish the Government its October metal, contracted for at 8c., at a lower price if the quotations of the leading mining paper report an average lower than 8c. for the month. This has had an unsettling influence. Yesterday and Monday further easing has been evident and the market is extremely dull.

Spelter.—The market continues weak. Demand is again at low ebb and quotations have fallen to 8c., St. Louis, or 8.25c., New York, but they are largely nominal. There seems to be absolutely no interest in the

market. It is stated that one producer on Monday offered October prime Western at 7.75c., St. Louis, but it is not known whether any sales were made at this price. Later reports state that the offer was withdrawn. For November and December the quotation seems to be about 8.12 1/2c., St. Louis, or 8.37 1/2c., New York.

Antimony.—Demand is of small proportions. Chinese and Japanese grades are obtainable at 15c. per lb., New York, duty paid.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is quoted at 40c. to 42c. per lb., New York, but there is little demand.

Old Metals.—We are quoting copper nominally on the basis of the Government regulation, but it is impossible for purchasers other than the Government to purchase heavy crucible copper at less than 26 1/2c. to 27c. per pound. We quote dealers' selling prices as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper, light and bottoms	22.50 to 23.50
Brass, heavy	18.00 to 18.25
Brass, light	14.00 to 14.25
Heavy machine composition	25.00 to 25.50
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	7.50
Lead, tea	6.50
Zinc	6.50

Chicago

OCT. 8.—Small lots of copper for immediate delivery, purchased by consumers who are compelled to buy in a hand-to-mouth manner, command from 28c. to 30c. Generally the metal market is dull. Tin is firm and fairly active. The course of old metals is downward, in keeping with the general trend, despite their being in better demand in place of virgin metal in melting. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 61.50c.; small lots, 63.50c. to 64.50c.; lead, 7.90c. to 8c.; spelter, 8.25c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21.50c.; copper clips, 21c.; copper bottoms, 20c.; red brass, 20.50c.; yellow brass, 15c.; lead pipe, 6c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 8.—The non-ferrous metals market has been rather dull during the past week. The quotations to-day at the close on carload lots were: Lead, 7.90c.; spelter, 8c. to 8.50c., according to delivery. On less than carload lots, lead, 8.50c.; spelter, 9.25c.; tin, 66c.; lake copper, held at 29c. without much business; Asiatic antimony, 20c. In the Joplin district there was a slump in prices, the low basis for zinc blende falling to \$62.50 per ton, basis of 60 per cent metal, with a range upward to \$75 per ton for the top grades. The average for the week in the district for all ore sold was \$65, the bulk of the selling being on the lower grades. Calamine was quiet at \$35 to \$40 per ton, basis of 40 per cent metal, with average for the week for the district \$39 per ton. Lead ore continued at \$90 per ton, basis of 80 per cent metal, but the market was unsatisfactory and the average for the week for the district \$88 per ton. On miscellaneous scrap metals, in which there was a reduction in price during the week, we quote dealers' buying figures as follows: Light brass, 10c.; heavy yellow brass, 13.50c.; heavy red brass and light copper, 18.50c.; heavy copper and copper wire, 20c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; tea lead, 6c.; lead, 6.50c.

Japan in 1916 imported from the United States iron as bars, rods, plates, sheets, bands, etc., quantities to the value of \$17,566,593. The value of these imports from Great Britain was \$9,823,206. Germany is reported as furnishing \$204,383 worth.

A book containing the official text of the war tax law together with the income tax law in its amended form has been issued by the National Bank of Commerce in New York.

Book Review

Compressed Air for the Metal Worker. By Charles A. Hirschberg. Pages viii + 321, 5 x 8 in.; illustrations, 294. Published by Clark Book Co., Inc. New York. Price, \$3.

In his preface, the author states that experience has impressed upon him "the dearth of practical information in published form relating to the industrial uses of compressed air." As a result of this impression, the author has gotten together in excellent form a comprehensive collection of dates and illustrations which he publishes under the somewhat misleading title of "Compressed Air for the Metal Worker." This title is misleading for the reason that many of the applications of compressed air described cannot be termed, in the strict sense of the word, as pertaining to the metal worker.

The book opens with a chapter on the history of compressed air, describing briefly its discovery and the main steps which have lead to the present applications. Then follows a chapter giving a glossary of compressed air terms, together with excellent illustrations of the various makes and types of compressors in use to-day. This chapter also contains several tables pertaining to the design and performance of compressors, which are arranged in an excellent manner. There are also chapters treating with the details of compressor design, compressor accessories and the methods of installing compressors and their accessories.

Following this is a section comprising three chapters, devoted to portable pneumatic tools, their care and operation and their varied applications. Here, again, the illustrations are excellent and practical tables of value are interspersed. These chapters deal with the subject mentioned in a broad manner, and later in the book the author has introduced chapters treating in detail with the application of portable pneumatic tools such as are used for hoisting, handling and conveying, and the use of compressed air for cleaning.

Before reaching these chapters, there is a section dealing with the use of compressed air in the foundry, and one dealing with the use of compressed air in the machine shop. The section pertaining to the uses of compressed air in the foundry is extremely interesting on account of the comprehensive descriptions and illustrations provided.

The book is concluded with chapters on the use of compressed air for the application of paint, lacquer, etc., and the uses of compressed air for pumping purposes.

E. C. R.

A booklet on "Industrial Fatigue In Its Relation to Maximum Output" has been published by Co-partnership Publishers, Ltd., 6 Bloomsbury Square, London, W. C., England. It appears to be a review of the notable experiments that have been going on in Great Britain and of investigations on continental Europe. It touches on the dilution of labor, scientific methods and management, the housing and welfare question, labor turn-over and after-the-war problems. The author, Henry J. Spooner, director of the Polytechnic School of Engineers, London, has obtained a foreword by Sir Robert A. Hadfield as representing a captain of industry and a foreword from J. R. Clynes, a member of Parliament, as representing labor. Sir Robert Hadfield explained that in the early part of the war, his industrial establishment employed some 15,000 and never shut down except on one or two holidays, but it did not pay. Latterly there has been no Sunday work and the result has been an output equally as great as before, a fact which he considers a proof of the inadvisability of employing non-stop and overtime methods. The pamphlet of 59 pages sells for 6d.

War tax calculations on a number of hypothetical cases have been issued in a four-page circular by the National Supply and Machinery Dealers' Association, 505 Arch St., Philadelphia. Five different conditions are covered.

Pittsburgh and Nearby Districts

Officials of the Westinghouse Electric & Mfg. Co., East Pittsburgh, deny the report that the company has received an order for 3500 aeroplane engines, the reported cost having been given as \$17,500,000.

The Public Service Commission has granted authority to the Wetzel Natural Gas Co., Charleston, W. Va., to increase gas rates from Oct. 1, 27c. per 1000 cubic feet, with a discount of two cents per 1000 cubic feet if paid on or before the 10th day of the month after bill is rendered. This higher rate is for domestic consumption.

Owing to conditions created by the war, it having called to the services some of the salesmen and engineers of the Blaw-Knox Co. of Pittsburgh, that concern has decided to close its Boston office while the war lasts. All inquiries and all work in the Boston territory will be handled hereafter through its New York office at 165 Broadway. The company states it is not its intention to replace any of the men who are giving their services to the country.

The Pittsburgh Steel Products Co., Pittsburgh, has awarded a contract for the construction of a new tube mill, consisting of two buildings, at Allenport, Pa., to cost \$75,000. The structures will be one-story, 236x660 ft., and 178x660 ft., respectively.

Increased Mineral Production

WASHINGTON, Oct. 9.—The total value of the mineral production of the country in 1916 was more than \$3,470,000,000, increasing \$1,076,200,000, or 45 per cent, over the \$2,393,800,000 recorded for 1915, and exceeding the former record year (1913) by more than \$1,000,000,000, according to preliminary figures compiled by the United States Geological Survey, Department of the Interior.

Practically all the minerals shared in this increase, gold being the only one of the more important products that showed a decrease in value, though silver and anthracite showed decreases in quantity but increases in value.

The metals established a new record in 1916, exceeding for the first time \$1,000,000,000 and approximating a total of \$1,622,000,000. Pig iron and copper contributed more than 78 per cent of the total increase of \$629,000,000, but large gains were made in zinc, lead, aluminum, ferroalloys, and tungsten ores. As compared with the figures for 1915, the metallic products increased 63 per cent.

Germany's Supply of Copper

Germany is now getting copper from several sources, according to the London *Ironmonger*. The Serbian copper mines are now being intensively exploited by the Germans and Austrians and good copper deposits are also said to have been found in Poland. Work has recently begun in the lead and copper deposits in the district of Kielce and in the neighborhood of Miedziana, Lysa Gora and Olkuss the methodical exploitation of these ores has already been started. The existence of copper in this district has long been known but under Russian rule the deposits were neglected, as the authorities devoted all their attention to the exploitation of the mines in the Ural.

The installation of heating furnaces at the plant of the Sizer Forge Co., Buffalo, has been practically completed. This work, which was designed and installed by the Fuller Engineering Co., Allentown, Pa., will be fired with pulverized coal. Waste heat boilers are also installed in connection with the heating furnaces and are arranged to obtain their supply of heat from the furnaces, or they can be fired with pulverized coal direct. The pulverized coal plant and equipment for four new open-hearth furnaces which the Fuller Co. is installing at the plant of the American Roller Mill Co., Middletown, Ohio, will be completed shortly.

PERSONAL

Frank Parrish, for many years assistant general purchasing agent of the American Bridge Co., Pittsburgh, and well and favorably known to the trade, has been appointed purchasing agent of the Canadian Steel Corporation, Ltd., effective Oct. 8, and will be located at Ojibway, Ontario.

H. W. Davis, New York sales manager of the American Hoist & Derrick Co., St. Paul, Minn., has been loaned by his company to the American International Corporation, which is building a ship assembling plant for the Emergency Fleet Corporation at Hog Island, Philadelphia. Mr. Davis will have supervision over the work of hoisting and conveying materials.

Robert Pierpont, superintendent Remington Arms Co., Chester, Pa., has joined the Dalton Mfg. Co., New York.

Edgar I. Mills, who has been identified for a number of years with the export branch of the steel industry, has joined the iron and steel department of the Federal Export Corporation. Mr. Mills resigned from the American Steel Export Co. Oct. 1, to assume his new duties.

Edmund Barany, machine designer of the Singer Mfg. Co., Elizabeth, N. J., is now mechanical engineer and assistant to general superintendent of the Cleveland Twist Drill Co., Cleveland.

W. P. Anderson, president Ferro Concrete Construction Co., Cincinnati, has received a commission as captain in the Engineer Officers' Reserve Corps and has been assigned to active duty as student at the Engineers' Training Camp at Belvoir, Va.

L. G. Julihn has been elected president of the Elliott-Fisher Co., Harrisburg, Pa., succeeding George F. Watt, deceased. Mr. Julihn will also act as general manager; he has been connected with the company at Washington in exclusive charge of patents for the past eight years, and in other capacities since 1900.

Paul L. Keiser, Pottstown, Pa., formerly connected with the Eastern Steel Co., has been elected president of the Pottstown Steel Products Co., which is now building a new plant for the manufacture of stacks, tanks and similar products.

John McNeil, Schenectady, N. Y., has been appointed general foreman of the boiler department at the Brooks plant of the American Locomotive Co., Dunkirk, N. Y.

E. Herbert Gilg, doing business under the name of Henry F. Gilg, selling the output of iron sheets for the Wilkes Rolling Mill Co., Sharon, Pa., is going to the front in the Signal Reserve Corps.

Edgar C. Felton, formerly president of the Pennsylvania Steel Co., has accepted an appointment as director of the Department of Civilian Service and Labor, under the Committee of the Public Safety, Philadelphia. In addition to his connection with various railroads and steel companies, Mr. Felton is now on the board of managers of the Girard Trust Co., and director of the Franklin National Bank and the Farmers and Mechanics National Bank.

R. Burdette Dale has resigned as chief engineer of the Erie City Iron Works, Erie, Pa., and has joined the Franklin Mfg. Co., Franklin, Pa., in the planning department.

Marvin W. Lutz has resigned as secretary of the Aultman & Taylor Machinery Co., Mansfield, Ohio, and has been succeeded by Benjamin Hurtthal, formerly assistant secretary.

Carl Oberstadt, formerly of the Standard Parts Co., Cleveland, has accepted the position of general superintendent of the Cleveland Works, Elyria Iron & Steel Co.

Edward A. Moss, formerly vice president and manager of the sales of the J. E. Moss Iron Works, Wheeling, Va., has severed his connection with that firm and established an engineering and sales office at 2031 Euclid Avenue, Cleveland, for the handling of all kinds

of structural steel, metal, iron and bronze products. He had been with the Wheeling firm since its formation and has made a particular study of the service required by the architect, engineer and contractor.

P. H. Withington, president of the Burchard, Roberts, Wales Co., structural engineers, Cleveland, and vice-president of the American Fork & Hoe Co., and E. P. Merrill, engineer, Cleveland, have been selected by the Government's sub-committee on airplanes to engage in work in connection with the development of the airplane back of the firing line in France, and will leave shortly for that country.

Ole K. Olsen, 822 Perdido Street, New Orleans, has been appointed sales agent for the State of Louisiana and the southern portion of Mississippi for the Asbestos Protected Metal Co., Pittsburgh.

R. A. Smart, formerly assistant manager of works of the Westinghouse Electric & Mfg. Co., and later works manager of the American and Canadian plants of the Oliver Chilled Plow Works, is now associated with the Tacony Steel Co., and the Tacony Ordnance Corporation, Tacony, Philadelphia.

R. J. S. Pigott has been made superintendent of the raw-material department, Bridgeport Brass Co., Bridgeport, Conn. He was formerly with the Remington-U. M. C. Co. at Bridgeport and the Sanford Riley Stoker Co.

Donald C. Wright, formerly production manager of the Remington Arms-Union Metallic Cartridge Co., Ilion, N. Y., is now production manager of the Dodge Mfg. Co., Mishawaka, Ind.

Major General George W. Goethals, who resigned recently from the general management of the Emergency Fleet Corporation, following differences with Chairman Denman of the Shipping Board, was elected president of the Wright-Martin Aircraft Corporation at a meeting of the board of directors last week. Since his departure from Washington, General Goethals has been devoting his time to his engineering firm, Goethals, Jamieson, Houston & Jay. George H. Houston, a partner of General Goethals in this firm, is vice-president of the Wright-Martin Corporation. J. F. Alford retired from the presidency to make way for General Goethals. Marshall J. Dodge of Betron, Griscom & Co., was elected a director and the other directors were reelected.

George M. Smith, chief engineer Walter Rachals & Co., Youngstown, Ohio, has become chief engineer of the Interstate Iron & Steel Co., Chicago.

James H. McKee, superintendent of the forge department of the Pittsburgh Screw & Bolt Co., N. S., Pittsburgh, has been called by the Government to Washington, to give his services in the mechanical department of the gas masks investigation.

G. B. Wickersham, former vice-president and general manager of the Diamond Forging & Manufacturing Co., Pittsburgh, Pa., has assumed charge of the Louisville Steel & Iron Co., Louisville, Ky., as vice-president and general manager. He proposes to put the plant on a continuous operation basis.

John J. Harty has been appointed president of the Canadian Locomotive Co., Kingston, Ont. Mr. Harty was previously vice-president and general manager of the concern. He is also a director of the Dominion Foundries & Steel Co. Mr. Harty is a son of the Hon. William Harty, who was, some years ago, president of the Canadian Locomotive Co., and is still one of its largest shareholders.

Samuel H. Whittaker, Walter-Wallingford & Co., Cincinnati, is convalescing at Grant Hospital, Columbus, Ohio, from a painful street car accident that happened in that city several days ago, in which an artery in his back was severed by flying glass. He is expected to be discharged from the hospital by the end of the present week.

Charles C. Cheyney, manager of the Chicago office and store of the Buffalo Forge Co., has a commission in the Naval Aeronautic Corps and is beach engineer at Pensacola, Fla., in charge of aeroplane engines.

Major L. J. Campbell, one of the vice-presidents of the Youngstown Sheet & Tube Co., Youngstown, Ohio, stationed for some months at Fort Benjamin Harrison,

is awaiting an assignment to a command with the National Army. He, with 16 other officers, has been relieved from duty at his former post at Fort Benjamin Harrison.

D. V. Sawhill, formerly in the sales department of the Pittsburgh offices of the Youngstown Sheet & Tube Co. but for some months in charge of the pipe department of the Cincinnati Iron & Steel Co., Cincinnati, has resigned, and has joined the Pennsylvania Signal Corps.

Edmund Barany, machine designer of the Singer Mfg. Co., Elizabeth, N. J., has assumed the duties of mechanical engineer and assistant to general superintendent of the Cleveland Twist Drill Co., Cleveland.

Coal Jobbers' Sales Regulations

WASHINGTON, Oct. 9.—Regulations intended to prevent jobbers from obtaining undue profits in selling coal have been promulgated by Harry A. Garfield, the Fuel Administrator. Jobbers who at the time of the President's orders fixing the price of coal at the mine had contracted to buy at or below the price therein set may not sell at a price higher than what they pay plus the proper jobbers' commission. All contracts binding at law are to be observed; but coal bought after the President's orders cannot be sold at a price above the one fixed by him, even if delivery was contracted for at an earlier date. In short, jobbers who have made contracts to sell at a high rate cannot now rush into the market, buy at the lower rate established, and sell above the maximum, thus making a greatly increased profit.

The regulations just made prescribe that all jobbers of coal or coke must register with the Federal Trade Commission by Oct. 25, stating the financial interest of all stockholders and partners of jobbing concerns in mines producing coal. Another rule issued by Dr. Garfield concerns methods of accounting by dealers, which the Fuel Administration wishes to reduce to a uniform basis, in order to make comparisons of cost without injustice to any one. Uniform cost-sheets are being prepared for distribution to dealers, who are required to furnish reports monthly, or at any time these are desired by the Fuel Administration at Washington or State fuel administrators.

Coal confiscated by railroads for their own use may be purchased from the owner at the price under which it was consigned when confiscated, if this is not above the figure set by the President. Exception must be made when it has been consigned under a contract that would stand in court, made before the Presidential order, in which case the railroad must pay the higher figure, if it wants the coal.

One of the most difficult problems it is said that the Fuel Administration has had to solve is that of who should pay the cost of hauling coal from "wagon mines," which have no rail connection, to the railroad. Thousands of these mines have started up lately, because of the high price of coal, without which they could not be operated at a profit. Loading cars from wagon mines, after the haul, is slow, which has meant the holding of cars longer than advisable at loading points.

The Fuel Administrator ruled that the product of these mines be shipped in box cars, when it is sent to the general market by rail, thus saving the open cars for the use of mines where the loading can be done most quickly. Where box cars are used by wagon mines a charge of 75 cents per ton, in addition to the President's prices, is permitted, to cover the cost of hauling and loading. The Fuel Administrator also ruled that where these wagon mines make deliveries directly to consumer by wagon or truck, the cost of the haulage may be added to the President's prices.

An assignment of a contract for the sale of coal, when made after the President's order applicable to the price of coal covered by the contract, will be treated as an actual sale of coal. For the present, cannel and smithing coal may be sold at current market prices; but the latter may be used for smithing only.

A. Buch's Sons Co., Elizabethtown, Pa., maker of land rollers and pulverizers, is again operating its foundry after an idleness of three years.

CARWHEEL MAKERS MEET

President Lyndon Reviews the Progress Made in the Past Year

The Association of Manufacturers of Chilled Carwheels held its annual meeting in New York City Oct. 9, at which the following officers were re-elected: President and treasurer, George W. Lyndon; vice-presidents, E. F. Carry and J. A. Kilpatrick; secretary, George F. Griffin; consulting engineer, F. K. Vial; board of directors—J. M. Buick, American Car & Foundry Co.; J. A. Kilpatrick, Albany Carwheel Co.; W. S. Atwood, Canadian Car & Foundry Co.; Charles A. Lindstrom, Central Carwheel Co.; F. K. Vial, Griffin Wheel Co.; E. F. Carry, Haskell & Barker Car Co.; A. G. Wellington, Maryland Carwheel Works; W. C. Arthurs, Mt. Vernon Car Mfg. Co.; J. D. Rhodes, National Carwheel Co.; F. B. Cooley, New York Carwheel Co.; A. J. Miller, Ramapo Foundry & Wheel Works; William F. Cutler, Southern Wheel Co.

From the address of President Lyndon the following extracts are taken:

"The recognition of a standard 850-lb. chilled iron wheel by the Master Car Builders' Association will dispel the illusions of our competitors with respect to the limit of the carrying capacity of chilled iron. It is now a well-established fact that the load that can be carried on a chilled iron wheel is only measured by the ability of the rail to support it. Many 33-in. 950-lb. chilled iron wheels are running under heavy engine tenders of 12,000 gal. capacity and are giving such a good account of themselves that no other type of wheel is considered by the users.

"It has taken a long time to bring this about, and the work we have accomplished this year is the result of persistent effort and close association with all the leading organizations of the country that study the wheel question, and we have also followed up with individual railroads the introduction of new standards. We deal not only with the Master Car Builders' Association, but are in close association with the American Railway Association, American Railway Engineering Association, Interstate Commerce Commission, Bureau of Standards, American Society for Testing Materials, American Foundrymen's Association and the State universities.

"While we have accomplished two-fifths of our program, we should not rest until we have secured the other three-fifths. We must see that the interior of the 625 and 725-lb. wheel receives recognition in the matter of increased plate thicknesses, which can only be obtained by additional weight. We must have a reasonable factor of safety when measured by excessive stresses encountered in service and these heat stresses are now recognized everywhere due to our educational campaign.

"We are not influenced by commercial considerations in asking for heavier wheels. We know the increased weights are necessary. Who knows what the result of the work of the University of Illinois may be? Perhaps the analyses of the stresses within the wheel may suggest a redistribution of the metal, and we may be able to decrease weights, which we will be ready to do with as great an interest as we are now anxious to increase them."

National Association of Purchasing Agents in Session

A convention of the National Association of Purchasing Agents is being held in the William Penn Hotel, Pittsburgh, this week, the first session having opened on Tuesday morning. E. L. McGrew, purchasing agent of the Standard Underground Cable Co., Pittsburgh, president of the National Association, had charge of the sessions. Robert Garland, president of the Chamber of Commerce of Pittsburgh, welcomed the delegates, and the response was made by J. R. Pels of New York, an ex-president of the association. The banquet was held Wednesday evening, Oct. 10, in the William Penn Hotel, Judge J. J. Miller of the Allegheny County Orphans Court acting as toastmaster. Dr. John A. Brashear and James Francis Burke were among the speakers.

MAKERS' CONTROL OF RESALES

Investigating Methods of Manufacturers to Maintain Resale Prices

WASHINGTON, Oct. 8.—Considerable doubt exists in the minds of officials of the Administration as to the legality of attempts by manufacturers to maintain resale prices on their products and for this reason the American Fair Trade League is attempting to persuade Congress to enact the so-called Stevens bill. In the meantime, the question has arisen whether or not trade practices adopted by firms who wish to maintain their resale prices are or are not "unfair trade practices."

The Federal Trade Commission has undertaken to solve this perplexing problem. There have been filed with this commission 27 complaints in all by firms who allege that methods adopted by producers to maintain the prices on their articles are unfair. In view of the large number of similar complaints the commission has decided to combine them all into one general inquiry. Hearings in this proceeding were begun last week at which all the members of the commission were present.

Commissioner Fort presided at these hearings. This was significant in that Commissioner Fort, while the Governor of New Jersey, had more or less experience with attempts to legalize maintained prices. At the opening of the hearings, however, he stated that the Trade Commission was approaching this subject with an open mind. The commission, he said, desires to have the views of all persons interested so that it can arrive at some conclusion as to its jurisdiction before proceeding further.

While the commission had attempted to hear all sides in the proceedings of last week, the witnesses present were predominantly in favor of the maintained-price idea. Therefore, when adjournment was taken after two days of hearings until Oct. 23, it was announced that on this later date opponents to these trade practices will be given an opportunity to present their views.

The first person to appear was Prof. S. McCune Lindsay of Columbia University. Mr. Fort announced that Professor Taussig, chairman of the Tariff Commission, would present his views at a later date. The position maintained by these two economists is identical, Professor Lindsay explained in opening. He condemned the maintained price from the point of view of consumers. He stated that the National Consumers' Association and similar organizations throughout the country have been formed to protect the rights of the consumers as against the dealers or middlemen. Any attempt to fix retail prices, he said, would be opposed to public interests and to the best interests of the consumers. The country wants greater economy and greater efficiency on the part of middlemen. Maintain the retail price, and this will not be had. The professor was asked what should be done to the merchant who offers for sale at less than cost a nationally advertised article of commerce in order to draw trade. He answered that he thought such a man could be prosecuted under the common law, may be, as attempting to monopolize trade. He did not think legislation authorizing the maintenance of retail prices should be adopted merely to check such a practice as that.

Witnesses then following were almost exclusively in favor of the maintained-price principle with the exception of Charles A. Keene, a watch merchant of New York City. William H. Ingersoll, of R. H. Ingersoll & Brother, insisted that a nationally advertised article had an added value and that such an article is much easier for the merchant to dispose of. George L. Record of New Jersey, appearing as attorney for Robert Ingersoll & Brother, reviewed the attempts of the New Jersey Legislature to legalize maintained prices. He pointed out the great growth of the American automobile industry, which he said is due in large measure to the fact that the retail prices of automobiles have been maintained. Among others present were Henry E. Bodman of Detroit, representing the Packard Motor Co.; Alfred Lucking, appearing for the Ford Motor Co., N. A. Peabody, of Cluett, Peabody & Co., Troy, men's collar makers, and K. H. Addington, of the

Benjamin Electrical Mfg. Co., Chicago. Mr. Addington recounted instances of cut prices among jobbers handling his company's electrical apparatus. He said it is impossible to maintain an equal competitive standing if the jobber is allowed to cut prices and thereby destroy the stability of the output of a company. He acknowledged that his company could not hope to compete with such a large concern as the General Electric Co. should the latter enter into a big national advertising campaign. The power to remain a competitor is possible under a system of maintained prices by which competition comes through the quality of the output.

Various retail organizations and associations were represented. Edmond A. Whittier, secretary of the American Fair Trade League, declared in a private interview that he was greatly pleased at the outcome of the hearing. He pointed out that more evidence in support of fixed prices had been offered on this occasion than at probably any other.

Russia's Iron and Steel Output

The pig iron and steel output of Russia in 1916, from statistics which are unusually late, was as follows, in net tons, according to U. S. Consul D. B. Macgowan at Moscow:

	1916	1915	1913
Pig iron	4,174,000	4,055,000	5,093,000
Semi-finished steel	4,696,000	4,523,000	5,404,000
Finished iron and steel.....	3,706,000	3,590,000	4,438,000

As in 1915 and 1914, the records established in 1913 were not attained; in fact production of pig iron in 1916 was less than in 1914 or 1913, and the improvement over 1915 was only 2.9 per cent.

There were 114 blast furnaces in operation in 1916, compared with 120 in 1915. Around Moscow the production has picked up partially, after a sharp diminution in 1915. The southern region produced 75 per cent of the total pig-iron output in 1916, the Ural 21 per cent and the Moscow district 4 per cent. In comparing 1916 and 1915 with the preceding years it is, of course, to be remembered that the Polish production in 1913 totaled 460,000 net tons. There was an increase of 3.8 per cent over 1915 and a falling off of 13.1 per cent from the record of 1913 in the output of semi-finished iron and steel. There has been an increase in the production of merchant bars at the expense of the output of beams, sleepers, rails, roofing and sheet iron and steel. There was a slight increase in the output of rolled wire.

Employees in the metallurgical branches increased from 343,850 in 1915 to 427,502 in 1916. As against the increase of 24.3 per cent in number of workers the growth of production was but 3.3 per cent.

May Buy Canadian Equipment

TORONTO, ONT., Oct. 8.—A highly important development for Canadian munitions plants, which are now contemplating retirement from the shell business, is the presence in Canada of inquiries from American industrial companies for the purchase of their equipment. If this inquiry assumes broad lines, it would be a boon to many companies which own such plants and have seen no other prospect than to scrap them. Many of the big concerns in Canada which have been large producers of shell castings or operated machining equipment have provided for their expenditures in that connection out of earnings, so that to them a sale at this stage of the game would mean clear profits. Several Canadian companies have received offers for their plants from across the border, but the matter is now only in the preliminary stage.

During July the construction of new steamships aggregating 125,000 tons was begun in Italian shipyards, and before the end of the summer a further 125,000 tons will be put in hand, according to the London Iron and Coal Trades Review.

OBITUARY



W. LESTER WALKER

W. LESTER WALKER, aged 45 years, and for some years general manager of the Allegheny Steel Co., whose plant is at Brackenridge, Pa., died in the Allegheny General Hospital, N. S., Pittsburgh, on Sunday, Oct. 7, of acute dilation of the heart. Mr. Walker was born in Shelocta, Indiana County, Pa., and when he was a boy, his family removed to Armstrong County, Pa. After finishing the public school course, he was graduated from Elders Ridge Academy. He taught in the Armstrong County schools for five years, and then became assistant principal of Elders Ridge Academy. In 1898 he took a minor position in the sales department of the Hyde Park Iron & Steel Co., at Hyde Park, Pa., manufacturer of sheets. In 1901 he was one of the organizers of the Pittsburgh Shovel Co., whose plant is at Leechburg, Pa., of which he was made a director and also general manager. In 1903 he became secretary and treasurer of the Muskingum Steel Co., at Zanesville, Ohio, sheet manufacturer. In 1909 he accepted a position in the order department of the Allegheny Steel Co., was rapidly promoted, and for five or six years has been general manager of that company. He is survived by his widow, three sons and three daughters.

CRAIG RIDGWAY died at his home, Coatesville, Pa., Sept. 28, aged 88 years. Mr. Ridgway was born July 20, 1829, at Crosswicks near Bordentown, N. J., and went to Coatesville in 1863, when he purchased the William Dripps foundry and machine shop. Although he had no experience as a manufacturer, he was successful from the beginning. The machine shop made a specialty of turbine water wheels and rolling mill machinery. Business was very prosperous during the Civil War and continued throughout later years. In 1877, Mr. Ridgway's oldest son, William H., was taken into the firm. A short time later, the late Andrew Ridgway, who died about three years ago, came into the business and the firm name was changed to Craig Ridgway & Sons Co. In 1890, Ellis B. Ridgway, a third son, entered the company. It made a specialty of the manufacture of steam hydraulic cranes and freight elevators, and the volume of business increased rapidly. As president and treasurer of the company, Mr. Ridgway was its active head for more than half a century and not until three years ago did he retire from active service. He is survived by his wife, who is in her eighty-sixth year, and one daughter, Mrs. Eliza R. Baker, and three sons, William H., Ellis B. and Dr. S. W. Ridgway.

EDMUND STEYTLER, for eight years general sales manager of the Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, died on Monday morning, Oct. 8, at Atlantic City, N. J. Mr. Steytler's health for a long time had been gradually failing, and he was on a long leave of absence from duty trying to recuperate. He had been connected with the Pittsburgh Steel Co. practically since its inception. He is survived by his widow, and two sons, one connected with the Pittsburgh Steel Co., Monessen, Pa., and the other is with the University of Pittsburgh Hospital Unit now doing service in France. He was born in Cape Town, South Africa, and came to the United States with his parents when a boy. He graduated from Washington and Jefferson College and was in the coal business for a short time. Later he went from Pittsburgh to New York and for a time was in the New York offices of the American Steel & Wire Co. He returned to Pittsburgh about 1900 and was employed by the Pittsburgh Steel Co. as a salesman. He was promoted rapidly and some years ago was made general manager of sales. He was member of the Duquesne Club, Country Club, Field Club, and the Pittsburgh Athletic Club.

THEODORE STARRETT, long prominent in steel building construction, died Oct. 9 at his home in Prospect Plains, N. J., after an illness of four weeks following a stroke of apoplexy. He was 52 years old and leaves his widow and two sons. He was born in Kansas and came of a family noted for its big building and contracting operations. His brother, Major W. A. Starrett, is chairman of the committee on building construction of the Council of National Defense, under whose direction army camps and cantonments have been built. Paul Starrett, also a brother, is president of the George A. Fuller Co., and his other brothers, Goldwin and Ralph, are respectively members of the firms of Starrett & Van Vleck, architects, and Starrett & Goss, building contractors. Coming to New York about 20 years ago, Theodore Starrett founded the Thompson-Starrett Co., which rapidly gained a high standing in the erection of steel buildings. He retired from the Company some years ago, devoting himself to the development of his New Jersey estate.

FRANCIS DAYTON CANFIELD, JR., Yonkers, N. Y., died Oct. 9, after a short illness, aged 55 years. At the time of his death he was managing director of the Cuban American Sugar Co.; vice-president of the Fulton Iron Works, St. Louis, and a director of the Canadian Foundry Co. He was born in Boonton, N. J., and leaves his widow, one son and two daughters.

WILLIAM DOUGLAS RICHARDS, Houghton & Richards, Boston, steel merchants, died suddenly, Oct. 3, while on his way to his home in Winchester, Mass. Mr. Richards was born in Columbus, O., Aug. 18, 1848, and went to Boston in 1870.

DR. ALLEN DEVILBISS, president of the DeVilbiss Mfg. Co., Toledo, Ohio, died Oct. 1, aged 76 years.

Tightening the Blockade Against Germany

WASHINGTON, Oct. 9.—England and the United States have been especially effective recently in tightening the commercial blockade of Germany. It was originally the suggestion of the Food Administration that prompted the Export Council to refuse to permit further exports of foodstuffs from the United States to European neutral countries. This order will stand until the end of the current calendar year. After that the neutrals must prove to us beyond any doubt that they are not selling to Germany and thereby contributing to the support of our enemies.

Following upon the heels of our action, England, during the past week, has cut off all of her exports to Holland and the Scandinavian countries. This is extremely significant when it is remembered that not only has it been suspected that food supplies have been leaking through Holland to Germany, but it is also reported here without contradiction that Sweden has been selling iron ore to Germany. The Swedish supply of ore is said to be of especial value to the Germans, who are being gradually driven back through the wealthy iron district of northern France.

Not only is it the apparent intent of the Allies to shut the doors of the European neutrals to Germany, but it is the intention to prevent neutrals in other parts of the world shipping goods to Europe which might reach the Germans. The Export Administrative Board has announced its policy in regard to the control of bunker coal to vessels, which is calculated to place an effective check upon such so-called neutral trading.

Too much must not be taken for granted, however, in the announced export policies of England and the United States. A final set policy toward the European neutrals has not been determined upon. If the neutrals will promise to play fair and deal in the open with the Allies, we will undertake to ration them and see that they have an adequate supply of foods and other necessary imports to meet their own needs. If the neutrals do not consider that a fair proposition, they have but one alternative and that is to show their favor for Germany in the open.

The Virginia Iron, Coal & Coke Co. has put its nodulizing plant at Middlesboro, Ky., in operation. It has been under construction for nine months.

SERIOUS LABOR TROUBLES

More Than 10,000 Metal Trades Workers on Strike at Seattle

SEATTLE, Oct. 6.—The strike of the metal trades union in Seattle, which has been threatening for more than seven weeks, has materialized, and more than 10,000 metal trades workers employed in the shipbuilding plants of the city and the smaller contract shops subsidiary to the shipbuilding industry are now out. The walkout completely closes down 91 Seattle firms, the list including machine shops, boiler works, brass foundries, iron foundries, blacksmith shops, pattern shops and 16 shipyards. Six of the contract shops signed up with the union, on the wage scale demanded, leaving 5,500 men still at work, including the crew of the big Skinner & Eddy Steel shipbuilding plant. Prior to the metal trades strike, more than 3,500 men were laid off as a result of the lumber strike situation, the sympathetic boycott strike having crippled the big steel shipbuilding plants to that extent. In addition to the three steel shipbuilding plants affected, the strike ties up 13 wooden plants. Practically all of the other concerns affected were engaged in contract work for the shipbuilding plants, and included the Kilbourne-Clark Mfg. Co., Pacific Coast Co., Clyde Casting Co., Fraser Pattern Works, Emery Machine Co., Gray & Barash, Western Engineering Co., Eagle Brass Foundry, and the Commercial Boiler Works, which builds the boilers for the big steel steamships constructed in Seattle. The lumber boycott and metal trades strike leaves work completely suspended on two warships and 12 great steel cargo steamships, besides 16 big wooden steamships on which work was stopped recently due to shortage of lumber. Work still continues on 14 other ships under construction at the Skinner & Eddy Co.'s plant and three wooden ship plants which signed up with the union within the past month. Excepting the warships, the strike brought to an end all work on a grand total of 104,000 tons in steel deadweight cargo capacity.

While at present the metal trades strike overshadows the lumber boycott situation, the latter has developed into a factor that seriously menaces the shipbuilding industry. It is now stated that settlement of the metal trades strike would prove of little avail now, as the lumber boycott in a short time would paralyze the three big steel plants. It is pointed out that the metal trades strike can be settled by the plants granting the new wage scale, but there is no such short and easy road out of the lumber situation.

No effort will be made to operate the big plants in Seattle, and the strike is absolutely peaceful. Forty-three machine shops, 10 blacksmith shops, nine pattern shops, 13 boiler works, 15 iron foundries and eight brass foundries are idle. Both the shipyard owners and the union have agreed that no adjustment can be reached prior to the arrival of the Wage Commission from the United States Shipping Board. Wage increase is the only demand made by the strikers.

The strike in shipyards of Portland which has been in progress for more than two weeks is still unsettled, and the plants are making no concerted effort to re-open. Small crews are working in most of the larger plants, but no definite headway has been made toward adjustment of the situation. During the period of idleness of their plants, the various shipyards are making a number of needed extensions and improvements at their plants, including overhauling of the entire premises and installation of needed machinery. Eleven big shipbuilding plants on the Columbia River, employing more than 7,000 men, have lined up solidly and definitely for open shop principles. Closed shop is the chief demand of the strikers.

Labor troubles have extended to the two big paper mill companies in Oregon City, the Hawley Pulp & Paper Co., and the Crown-Willamette Co., which have definitely refused to sign the agreement presented by the paper mill union for closed shop. It is feared a general walkout will result. About 1,700 employees of the two plants are unionized.

The return of the lumber industry to a normal basis in the near future is confidently predicted by lumbermen of the Northwest. Lumber production has reached 28 per cent of normal, and it is stated that only a very small number of the mills have returned to the eight-hour basis demanded in the lumber strike.

A Unique Engineering Agency

The United States Department of Labor recently created, as a part of its employment service, a division whose function it is to aid the employer in obtaining suitable help, and professional persons in securing suitable employment. This is known as the Teachers and Professional Service Division. While intended to embrace all professions, attention has thus far been confined to the teaching and engineering professions. The services of the division are absolutely free to both employer and employee, all expenses being borne by the United States Government. Its methods are thorough, and no service is rendered the applicant until the division has learned, from persons familiar with the applicant, that he is qualified as to training, experience, and personal qualities for the position he seeks. When an applicant is recommended for a reported vacancy, the employer is given an opportunity to examine the data gathered in the course of this investigation, thus effectually preparing for the final and most important step, the personal interview, and for this ample facilities are provided in the offices of the division where employers may meet with prospects on appointment.

Employers and professional engineers everywhere are invited to avail themselves of the services of this division which, as stated above, are entirely free. Employers in reporting positions are asked to state the nature of the position, its duties, requirements, etc., the probable salary and probable duration of employment. Applicants for registration should indicate in the first letter the nature of the position desired so that the proper blank may be furnished. All communications should be addressed: Teachers and Professional Service Division, U. S. Employment Service, 845 South Wabash Avenue, Chicago.

News of the Labor World

The Lebanon Blast Furnace Co., operating the Meily stack at Lebanon, Pa., has increased the wages of all employees at the local works, effective Oct. 1.

About 1000 machinists employed by the W. & A. Fletcher Co., Hudson Street, Hoboken, N. J., manufacturer of marine engines and boilers, returned to work Oct. 3, after a strike of about 12 weeks, following a general wage advance by the company. The men asked 50 cents a day additional at the inception of the strike.

With only three dissenting voices, the employees of the John Coughlan & Sons shipyards decided to go on strike for higher wages at a meeting held in Vancouver, B. C., Oct. 4. The men have quit work. The decision of the men represents the culmination of several days' negotiations between representatives of the men and the heads of the company. The men demand increases which average about 30 per cent over the present scale of wages. About 700 men are affected.

The Continental Supply Co., whose St. Louis quarters have been in the Third National Bank Building, are to be removed to the Post-Dispatch Building, Twelfth and Olive Streets, where one entire floor and one quarter of another have been leased. The company specializes in pipe and tubing for gas and oil well operations and refinery operations. It operates 29 branches.

The Vulcan Steel Products Co., New York, has opened an office in Havana, under the management of G. O. Simpson. In connection with this office there will be maintained a permanent exhibition of machinery and steel and iron products, in which the company deals.

The Macleod Co., Cincinnati, to take care of expanding business in sand blast equipment and metallurgical furnaces, has enlarged its plant and increased capital to \$100,000.

HUGE NAVY PROGRAM

Construction of 787 Vessels Provided For Costing Over \$1,500,000,000

The war-construction program of the United States Navy now comprises 787 vessels, including all types from super-dreadnaughts to submarine-chasers. Some of these have been completed in the past few weeks and are now in service. The rest of the program is being pushed to completion. The total cost is estimated at \$1,150,400,000. Secretary Daniels announced Oct. 9 that arrangements have been completed for the building of the large number of additional destroyers planned, which will cost about \$350,000,000. The Secretary said:

"These destroyers will be built by five companies which have had experience in building this type:—the Fore River Shipbuilding Corporation, Boston; the New York Shipbuilding Corporation, Camden, N. J.; Cramps' Shipyard, Philadelphia; the Newport News Shipbuilding & Drydock Co., Newport News, Va., and the Union Iron Works, San Francisco.

"This is the biggest project we have ever undertaken. Three months ago it looked as if it could not be done. Orders had already been given for all the destroyers the yards could build, and almost as many as the new program calls for are now under construction or contract. To build rapidly the additional destroyers requires a great extension of shipbuilding facilities and the erection of new plants for building engines. The companies were unwilling to invest millions in these additions so the Government must build and will own the new plants and extensions which will be used by the builders.

"We are putting every energy and facility behind this project. Some of the new destroyers are promised for delivery in nine months, all within eighteen months. These vessels will be of the latest and largest improved type, which has just been tried in our service and found to be unsurpassed by any destroyers in the world. The plans are all ready and the adoption of a uniform type will enable us to reduce the number of types of engines and parts and to turn them out in much less time. The principal trouble is in getting forgings and auxiliaries, but the manufacture of these has been arranged for, and we will make every effort to prevent delay in delivery of materials or machinery."

Wages in Navy Yards

WASHINGTON, D. C., Oct. 8.—The presidents of international trade unions held a conference here last week with the joint Army and Navy Board on the adjustment of wages in navy yards and arsenals, of which Assistant Secretary of the Navy Roosevelt is chairman. A tentative agreement was reached in regard to wages by which it is proposed to compensate the workmen for increases in the cost of living.

After the meeting Assistant Secretary Roosevelt said:

"The conference discussed the matter of the existing wage scale at navy yards and the possibility of adjusting the scale on a more uniform basis for all yards and similar trades. It also discussed the advisability of establishing for the duration of the war some method by which the wage scale would not be subject to local fluctuations and fluctuations in different trades, but would be based on some kind of sliding scale dependent on future increase in the cost of living, in case such increase takes place."

The board gave hearing to representatives of the different trades at Norfolk, Philadelphia and Washington Navy Yards.

The Dalton Machine Co., 1911 Park Avenue, New York, builder of bench lathes and special machinery, has changed its name to the Dalton Mfg. Corporation. No changes are contemplated in the management of the company.

PIG IRON SCHEDULE

Prices to Be Recommended to the War Industries Board

The committee of the American Iron and Steel Institute, which has been considering price schedules on pig iron and various steel products, left Tuesday afternoon for Washington and will present to the War Industries Board a report of some of its findings. The schedule for pig iron has been carefully worked out as a result of conferences between the iron producers and the committee. As a basis for the discussion on prices, it was agreed that the prices to be fixed should be f.o.b. cars at any furnace, and not base Valley furnace, as many in the trade have been led to believe was the intention at first. It was quickly decided that to fix a base price for pig iron at Valley furnace would create so much confusion in the various differentials and freight rates that the trade would be hopelessly muddled. The incompleteness of the first agreement at Washington, upon which the President's announcement was based, is shown by the fact that even members of the War Industries Board who were interviewed by pig iron men in Washington last week differed as to what was meant, one holding that the pig iron price was to apply only at Valley furnace and another that it meant any furnace.

In discussing prices for foundry irons, it was decided to grade the irons according to their silicon content. Iron containing from 1.75 to 2.25 per cent in silicon (No. 2 plain) is to take the base price of \$33; 2.25 to 2.75 per cent in silicon, \$33.50; 2.75 to 3.25 per cent in silicon, \$34.50, and for every half unit in silicon above 3.25 per cent there will be an additional dollar per ton. Foundry iron commonly known as No. 3, with silicon content of from 1.25 to 1.75 per cent, is listed at \$32.50. All of these prices will apply on foundry irons not over 0.05 per cent in sulphur. On forge iron it was decided to recommend a differential of \$1 under the base price, making it \$32 for grades with sulphur 0.07 and over and \$32.50 for grades containing 1 to 1.75 per cent silicon and sulphur under 0.07. Malleable pig iron is to be 50 cents above the base, or \$33.50. On Bessemer iron, it was decided to recommend a differential of 10 per cent above the base, or \$36.30, which is the price at which a fair tonnage was recently sold at Valley furnace.

Charcoal irons were tentatively fixed as follows: Warm blast Lake Superior charcoal, \$35.50; warm blast Southern charcoal, \$10 above base, or \$43 on grades 0.40 to 0.60 in phosphorus and silicon 1 to 2 per cent; cold blast charcoal, \$25 above base, or \$58.

Low phosphorus iron prices are to be based on the grade containing 0.04 per cent phosphorus and sulphur, copper bearing, which was put at \$55. Copper free phosphorus iron is to sell, on this basis, at \$58. For each reduction in phosphorus of 0.005 below 0.04, there is to be an increase in price of \$1.50. For each 1 per cent of silicon in excess of 2 per cent, there is to be an addition of \$1.75 per ton.

On silveries and Bessemer ferrosilicon, prices are to be established based on their silicon content, as with the other irons.

In discussing the differentials to be fixed on pig iron high in manganese, it was suggested that when the manganese content is from 1 to 1.50 per cent, an advance of 50 cents per ton be made and that \$1 be added for each half per cent of manganese above 1.50 per cent.

Bessemer Sales

PITTSBURGH, Oct. 10.—(By Wire)

Sales of about 15,000 tons of Bessemer pig iron have been made at the tentative price of \$36.30, Valley furnace, and 10,000 tons of basic at \$33, Valley, for shipment as fast as possible.

THE CLOSED OR OPEN SHOP?

Walter Drew, Counsel for National Erectors' Association, Ably Upholds the Open Shop

In an address before a gathering of manufacturers, professional men and general business men at the Hotel Green, Danbury, Conn., Oct. 1, Walter Drew of New York City, counsel for the National Erectors' Association, made a strong argument for the open shop. He based the consideration of the subject at this time on the fact that the present world crisis has brought general recognition of the fundamental importance of industrial questions, on which the fate of nations is now seen to rest. He first pointed out

The Duty of the Employer

"Since industry under the present form of capitalistic control has been in the hands of the employer, he must share responsibility for whatever conditions arise. Upon him, also, rests the chief responsibility of finding a solution. That solution will not come if he acts selfishly. He must seek the common good. He must labor to establish industry upon a sane, wholesome and just foundation, and he must co-operate with those who are working to these ends. He must consider himself, not as merely engaged in business for individual profit, but as a trustee for the beneficial use of the forces of production that he controls."

"This viewpoint of the employer's duty must be the basis of his co-operation with other employers. No association of employers will endure or deserve to endure which is founded upon any other basis. The making of large profits for the employer can no longer be considered the sole test of business success. Industry has not performed its function unless it brings betterment of conditions and increased comforts to the worker as well as the owner and unless its product is made available to the general public at prices as low as possible through efficiency and unrestricted production. This broad view by the employer as a working principle in his own business and in his association with other employers is not altruism but is being found to be a sound, constructive business philosophy."

Logical Result of the Closed Shop

To-day, Mr. Drew said, the foremost labor question in this country is that of the closed shop, or a shop where only union men are employed and where non-union men are excluded. A nation-wide effort to extend the closed shop in our industries, taking advantage of our war-time necessities, is being made. Every community and every industry faces this issue. Mr. Drew then proceeded dispassionately and with a complete avoidance of harsh criticism to discuss the closed-shop problem from the standpoint of the union man, showing by logical steps how finally the immense power of the closed-shop union and its members over industry is exercised without penalty or responsibility in case of mistake, abuse or bad faith. This condition, he said, is unique and is not found in any other department of the business world.

"The weaknesses of the closed shop, its failure as an industrial institution, are due not so much to bad faith, or vicious conduct, or any unworthy motive on the part of the union man, as to his limited and shortsighted viewpoint, his lack of understanding of economic principles and forces, his tendency to seek the apparent and immediate benefit, and his failure to understand and to seek the ultimate good. And in all this he is human, and his counterpart in varying degree is found among all of us."

"If a grocer mismanages his business through ignorance or shortsightedness, he fails and another grocer takes his place. So it is with the business man generally. Each pays the penalty for his lack of ability, and his failure, while it may affect others, still does not amount to a general catastrophe. If all the manufacturers of a given industry, however, should act together on lines that were ill-conceived and fundamentally unsound, then disaster to the whole industry would

follow. These same things are ever more true of the worker. If all the workers of an industry, or a community, or a nation share erroneous ideas which form the basis of their philosophy and which they are able to carry out into actual and general practice, the degree of the injury to the industry, the community, or the nation will be measured by the degree and extent of the error. Since productive industry rests upon labor, there will be no alleviating influences; the error will work its full damage and whatever disaster follows will be general."

A Lesson from Great Britain

After discussing the well-known methods practised by closed-shop workers to decrease output, to compel the employment of more men to do a given piece of work and generally to make labor scarce, Mr. Drew gave some chapters of British industrial history, showing how the progressive control of practically all industry in Great Britain by closed-shop unions had reduced that country at the outbreak of the present war to such a state of general inefficiency as to be totally unable to meet the exigencies of the situation. He showed how the problem of increasing industrial efficiency was met and solved by the setting aside of hard and fast union rules and now, he said, "most significant to us in facing our present problems, we find the principles of the open shop agreed to and put into operation as the only way of bringing British industry to a state of efficiency where it can meet the national crisis." He added:

"We find England with hundreds of thousands of women and non-union men working side by side with union men, with old restrictive rules laid aside, or at least modified, with new methods, new machinery and new spirit, performing industrial miracles, although England still faces the serious problems of peace readjustments over which hangs the shadow of the national solidarity of skilled labor. If England found the open shop a national necessity in the time of her greatest crisis, shall we, in our time of need, extend in our industries the system which brought her to the edge of ruin?"

Our Strength Lies in the Open Shop

It may be said, continued Mr. Drew, that we do not have in this country the restriction of output practised in Great Britain. The explanation is simple. The great bulk of our industries are open shop. In a recent official report as to the conditions in our industries, made to the Secretary of War, it was pointed out that practically 90 per cent of the establishments that would be called upon in the work of war preparation were open shops. Our national industrial efficiency, our prosperity, our expanding foreign trade and commerce, the high wages of our workmen, doubling and even trebling those of any other nation—all find their foundation in open-shop industry. He concluded his address with a narration of closed-shop experience in this country and its inevitable handicapping of industry, urging the unions to use their power and influence not to decrease the supply of labor but rather to increase the demand for it.

National Defense Trade Committees Quit

WASHINGTON, Oct. 9.—Director Gifford of the Advisory Commission of the Council of National Defense has announced the intention of the council to discontinue the so-called trade committees, having been persuaded to take this action partly by reason of the apprehension of certain members who are fearful of Section 3 of the food act. Some have already resigned. On the other hand, the council has decided that the need for trade advice hereafter can be obtained equally well from war service committees appointed by each individual trade itself, to sit in Washington and advise with the Government whenever it is necessary. They will be purely representatives of the trade and have no Governmental status. Mr. Gifford thinks it will take at least 60 days within which to make the transition or reorganization.

The Chamber of Commerce of the United States has

been enlisted to assist in prevailing upon the various industries to organize their war service committees to take over the work of the trade committees of the council. In undertaking this work the National Chamber has distributed a bulletin to its membership suggesting the character of service that should be furnished by the members of such committees.

More Tinplate Next Year

Demand for tinplate from all corners of the globe and the consequent high prices prevailing have not only attracted more capital and resulted in the erection of new mills, but have led the existing mills to tin a much greater proportion of their black plate production than is ordinarily the case, according to the Bureau of Foreign and Domestic Commerce, Department of Commerce. Assuming the practice will be followed next year, the following estimates based on figures made public by the Tin Plate Conservation Committee and on returns from the large producers are as follows:

	Base Boxes	No. of Companies Reporting
Estimated hot mill production for 1918	38,700,000	12
Estimated production of coke tinplate for 1918	36,450,000	12
Total shipments for first eight months of 1917	22,843,779	10
Shipments of coke tinplate for food containers, first eight months of 1917:		
(a) Domestic	12,750,350	10
(b) Canada	587,372	8
Shipments of coke tinplate for oil cans for first eight months of 1917:		
(a) Domestic	924,316	8
(b) Export	591,951	8
Shipments of coke tinplate (including silvered tin) for tobacco containers—first eight months of 1917	721,443	5
Shipments of coke tinplate for bottle caps and stoppers—first eight months of 1917	644,522	6
Shipments to jobbers—all tin mill products—for first eight months of 1917	1,030,019	9
Total shipments to foreign countries, first eight months of 1917:		
(a) Canada	1,080,332	8
(b) Other countries	1,448,001	8
Obligations as of September 1, 1917:		
(a) For food containers	7,186,577	11
(b) All other purposes	8,433,183	11

Unless greatly increased shipments are made to the oil, tobacco and bottle cap manufacturers during the last quarter, their consumption this year, it is added, will be approximately one million base boxes each for tobacco and bottle caps and two million boxes for oil. While this is probably as much as was used in the same industries last year, it falls far short of meeting this year's requirements.

Spain's Steel and Ore Output

Spain's output in 1916 of some of the principal metals and minerals as well as steel ingots, etc., is given in the following table, as compared with the 1915 figures in tons:

	1916	1915
Iron and steel ingots, blooms, etc.	820,657	827,149
Iron ore	5,856,861	5,617,839
Iron ore briquettes	363,784	132,218
Manganese ore	14,178	14,328
Iron pyrites, common	953,679	730,568
Iron pyrites, cuprous	1,748,742	1,464,350
Briquettes	555,975	555,357

These data come from the Consejo de Minería of Spain, a volume of nearly 500 pages giving metallurgical and mineral statistics of the country.

It is reported from Stockholm that the Grängesberg Co. has informed the railroad authorities that it is compelled to suspend the forwarding of Kiruna iron ore and that, from Aug. 15, no railroad cars will be loaded for the Swedish port of Luleå or the Norwegian port of Narvik. In explanation it is stated that the warehouses for iron ore at Narvik are overflowing and that there is no cargo space available for carrying it away. The construction of new ore warehouses at Narvik has recently been started.

GREAT FLEET OF AIRPLANES

Secretary Baker Tells of Progress Made by the Government

WASHINGTON, Oct. 9.—Further "censored" information regarding the production activities planned to produce the great American fleet of airplanes has been promulgated by Secretary of War Baker. In brief the aviation situation was stated as follows:

Contracts have been let and work is in progress on practically the entire number of airplanes and motors for which provision was made in the \$640,000,000 aviation bill passed by Congress in July. This program called for more than 20,000 airplanes.

The types of airplanes now in process of manufacture cover the entire range of training machines, light high-speed fighting machines and powerful battle and bombing planes of the heaviest design. Our contracts call for an ample number of training machines and embrace as well giant battle planes capable of the work of the Caproni, the Handley Page and similar types.

Every measure of insurance has been taken that the American forces in France shall be amply equipped with aircraft. The work of the Aviation Section has been thoroughly systematized. The training of aviators, the building of motors and the construction of wings are proceeding uniformly—each keeping pace with the other and with general war plans.

The comprehensive plan is that, when motors are ready, there shall be ready also the planes necessary; and, when the motors and planes are ready, aviators and machine guns shall be available. Co-ordination has been developed in every branch of the aviation section.

Within a reasonable time, considering the period for preparation, this country will send its first airplane to Europe. This airplane, from the tip of its propellers to the engine, machine gun and camera, will have been made in the United States.

It has been necessary greatly to develop and expand the aircraft industry in this country. This work of increasing the output of existing manufacturing establishments, creating new plants, and providing tool, gage and jig equipment for great quantity production has required time, and the months of the summer have been, and the early fall will be, devoted to this essential groundwork.

United States airplanes are being constructed both in this country and abroad. Approximately one-fourth of the number soon needed will be made abroad.

Provision has been made also for the manufacture of the many accessories necessary to aircraft service at the front. Sources of supply for machine guns, observation apparatus, cameras, scientific instruments of navigation and precision, and many other specialties of the aircraft art have been provided. Both in this country and abroad, this work has been under the direction of skilled men.

The designing of the "Liberty Motor," previously referred to by the Secretary of War as probably the greatest single achievement of the war, has been accorded foreign recognition. Our Allies have already asked for samples of these motors and are investigating the possibilities of quantity production in this country.

The United States to-day is in practical control of many of the materials required for the manufacture of aircraft both for this Government and its Allies. Steps have been taken for the conservation and distribution of such materials and the great resources of this country. Under the direction of the Aircraft Production Board, there is being accomplished an international standardization in the tests of materials and their specifications, so that through a unification of the demands upon this country there may be full use of our resources.

An Order-in-Council has been passed at Ottawa, Can., under the War Measures Act, prohibiting the exportation of steel rails from Canada abroad to countries other than the United Kingdom, British possessions and protectorates.

Machinery Markets and News of the Works

ORDNANCE PLANTS BUYING

New Companies Need Many Machines

Astounding Volume of Buying Develops from the Continually Expanding War Program of this Government

A great deal of the activity reported from machine-tool markets during the past week centers around the production of guns and shells for the use of the United States Army in France. It is expected that new shell contracts will be given out this week in Washington and a number of companies which have some of this work in prospect are figuring on their additional machine-tool requirements. The Ordnance Department of the army has been extremely busy interesting manufacturers in various parts of the country in the building and equipping of plants for making gun carriages and mounts, firing mechanisms, gun forgings, shells, etc., and its work is bearing fruit. Where no single company can be found to do the work, attempts have been made to interest a group of manufacturers who will combine their energies, resources and experience in promoting the establishment of plants such as the Government requires.

Efforts have been made to interest St. Louis manufacturers to equip a plant for the manufacture of gun carriages. In Chicago a company is being promoted to build tools required for making big guns. Detroit manufacturers, some of them identified with automobile companies, have co-operated to organize a \$2,000,000 company, which has obtained a \$30,000,000 Government contract for gun mechanisms. Considerable quantities of new equipment will probably be required. An Eastern company will probably receive a contact this week for making gun mechanisms and will require about \$500,000 worth of machine tools, most of which have been inquired for.

Among other ordnance and munitions activities are the following: The Standard Ordnance Co., 115 Broadway, New York, is inquiring for equipment for a plant at Hamilton, Ohio, which will be on Government work, the exact nature of which has not been disclosed. Another Ohio manufacturer, it is reported from Cleveland, is in the market for about 145 machine tools, mostly lathes and milling and drilling machines. A large list of machines to be purchased by the American Brake Shoe & Foundry Co., Erie, Pa., to be used on shell work, is expected soon. A company in Detroit is inquiring in the Cleveland market for 10 or 12 screw machines for making fuses for high explosive shells. The Government is inquiring in Cleveland for about 25 turret lathes. The Forest City Machine & Forge Co., Cleveland, has recently received an order for 2,300,000 detonators for 3 and 4-in. shells and is erecting an addition to its plant. The Cleveland Ordnance Co., Cleveland, is expected to place orders soon

for machines for forging, rough turning and boring 3 and 4-in. guns.

The Chamber of Commerce of Bucyrus, Ohio, has raised \$300,000 for the American Clay Machinery Co. and the Allen Motor Car Co., that city, \$200,000 of which will be used for building an addition to the plant of the American Clay Machinery Co., which has a shell contract, and \$100,000 for the plant of the Allen Motor Car Co., which is building motor trucks. Both of these companies may need additional equipment.

Dayton, Ohio, manufacturers are preparing to commence work on contracts for shells that will aggregate \$20,000,000. The Colt's Patent Firearms Mfg. Co., Hartford, Conn., which has acquired the plant of the New England Westinghouse Co., Meriden, Conn., may need additional machine tools for the latter factory, which will be converted from rifle work to the manufacture of Browning machine guns. The Osgood Bradley Car Co., Worcester, Mass., is inquiring for tools for building gun mounts for the Government. A Pottstown, Pa., manufacturer is in the market for equipment for a complete plant for making 6-in. shells. The Rock Island Arsenal, Rock Island, Ill., continues to buy. The Tucker Supply Co., York, Pa., which has a contract for gun sights, has acquired additional manufacturing space and is in the market for machine-tool equipment.

The J. G. White Engineering Corporation, New York, which recently placed orders on behalf of the United States Army for about 800 machine tools to be shipped to airplane engine factories in France, where 5000 Liberty motors will be made, will be in the market again this week, it is reported, for a list of tools approximating the former list. Other airplane companies continue to buy to round out their requirements. The Nordyke & Marmon Co., Indianapolis, has placed orders within the past week.

Shipbuilding buying also continues very active. The American International Corporation is seeking manufacturers to build winches for the ships it will turn out for the Emergency Fleet Corporation. The Submarine Boat Corporation and the Lackawanna Bridge Co. are doing considerable miscellaneous buying for their plant near Newark. Charles L. Seabury & Co., Morris Heights, New York, will build five mine sweepers for the United States Navy, and are in the market for punching and shearing machinery, bending rolls, air tools, etc. It is expected that the New York Shipbuilding Corporation, Camden, N. J., will come into the market this week for a large number of machines and cranes for an addition to its plant for building torpedo boat destroyers. The Union Iron Works, San Francisco, Cal., which is reported to have obtained a contract for 40 destroyers, may buy additional equipment, though it placed large orders in the New York market a few months ago, which considerably increased its capacity. The Fore River Shipbuilding Corporation, which is buying for an addition to its plant for building destroyers, is reported to be considering locat-

ing some of its factory buildings at a point distant from Quincy, Mass., because of the labor situation. Buffalo has been mentioned as a probable location.

There are many miscellaneous inquiries in the various markets. The Marlin-Rockwell Corporation is buying for its Standard Roller Bearing plant near Philadelphia. The Marconi Wireless Telegraph Co., Roselle Park, N. J., is preparing to increase the size of its plant and is buying new equipment. The International Motor Co., Plainfield, N. J., has bought a few tools for work on a Government motor truck contract. The Electric Machinery Co., Minneapolis, Minn., is building an addition and advises that it will require a 4-motor, 25-ton traveling crane with 60-ft. span, several 16-ft. boring mills, also lathes, milling machines, punch presses, drill presses, etc.

The Penn Seaboard Steel Corporation has closed with Alfred Box & Co., Philadelphia, for three 30-ton traveling cranes for its new steel foundry at Chester, Pa. The Donner Steel Co., Buffalo, has recently bought six cranes. The city of Bergen, Norway, is in the market for 32 cranes. Specifications may be examined at the offices of the Bureau of Foreign and Domestic Commerce.

New York

NEW YORK, Oct. 9.

The J. G. White Engineering Corporation, which a few weeks ago bought about 800 machine tools for the United States Government to be used in the manufacture of 5000 Liberty motors in France, will this week begin the purchase of another lot of about the same size.

It is expected that the New York Shipbuilding Corporation will come into the market this week for a large number of machines and cranes for the expansion of its plant at Camden, N. J., to provide facilities for the building of torpedo boat destroyers for the United States Navy.

The Fore River Shipbuilding Corporation, which is buying for an expansion of its plant at Quincy, Mass., is reported to be seeking another location for some of the manufacturing buildings on account of the scarcity of labor at Quincy. Buffalo has been reported as a probable location for shops to make turbines, boilers and other destroyer equipment.

Charles L. Seabury & Co., Morris Heights, New York, shipbuilders, are in the market for considerable equipment, including punching and shearing machinery, bending rolls, air compressors, air tools, etc. They have received a contract from the Navy Department for the construction of five mine sweepers.

The Marconi Wireless Telegraph Co. of America will greatly increase the size and capacity of its plant at Roselle Park, N. J., and is buying new equipment. The International Motor Co., Plainfield, N. J., which has a Government contract for 1000 motor trucks, has bought a few tools. Other buyers of a few tools are the Goulds Mfg. Co., Seneca Falls, N. Y.; the Taft-Pierce Mfg. Co., Woonsocket, R. I., and the Singer Sewing Machine Co., New York.

Schewan, Tomes & Co., 10 Broadway, New York, are in the market for radial drill, boring lathe, brake lathe and screw machine for export to China.

The city of Bergen, Norway, is in the market for the following cranes: Two 30-ton rotating; 20 1 1/2-ton traveling; 10 2 1/2-ton alternating to 5-ton. Specifications are on file at the office of the Bureau of Foreign and Domestic Commerce, Custom House, New York. The Donner Steel Co., Buffalo, N. Y., has recently bought six cranes.

The Liberty Ordnance Co., New York, has been incorporated with a capital of \$15,000 to operate a general foundry and machine shop. T. Pomeroy, F. H. Brownell and R. P. Branley, 2386 Grand Avenue, are the incorporators.

The Peerless Iron Pipe Exchange Co., New York, has been incorporated with a nominal capital of \$5,000 to manufacture pipe and cast iron fittings. A. Hausman, J. L. Nova and S. J. Cutler, 787 Bedford Avenue, Brooklyn, are the incorporators.

Albert V. Ellis, Long Island City, L. I., has had plans prepared for the erection of a new one-story pattern shop, about 70 x 70 ft., at Orchard Street and the Boulevard, to cost \$10,000.

Peter N. Layton's Sons, Inc., Oyster Bay, has been incorporated with a capital of \$12,000 to operate a wheelwright and blacksmith works. W. F., P. N. and P. N. Layton, Jr., Oyster Bay, are the incorporators.

The Messinger Automatic Sales Corporation, New York, has been incorporated with a capital of \$33,750 to manufacture automatic selling machines. H. K. Milliken, A. H. Hadden and E. J. Koehler, 350 Broadway, are the incorporators.

The Restaurant Machinery Co., 51 Liberty Street, New York, has acquired property at 124-126 White Street for extensions.

The Bureau of Yards & Docks, Washington, D. C., will build new machine and structural iron shops for the hydraulic plant at the Brooklyn, N. Y., Navy Yard to cost about \$80,000.

The Welding Equipment Co., New York, has been incorporated with a capital of \$30,000. J. D. Robinson, J. H. Deyo and G. E. Morris, 63 Nassau Street, are the incorporators.

The Norma Co. of America, 1790 Broadway, New York, manufacturer of ball bearings, has acquired property on the Boulevard, near Marion Street, Long Island City, and contemplates the erection of a new plant.

The Langbein Holding Co., 226 Henry Street, Brooklyn, is building a new three-story factory on Willoughby Street and Flatbush Extension, for the manufacture of surgical instruments.

The Scientific Apparatus Co., 110 West Thirty-fourth Street, New York, with manufacturing plant at 359 Seventh Avenue, has increased its capital from \$12,000 to \$25,000.

The Continental Battery Co., Brooklyn, has been incorporated with a nominal capital of \$5,000 to manufacture batteries. The incorporators are J. R. and A. T. McCafferty and E. Ziegler, 620 West 135th Street.

G. Ernst, Bronx, New York, operating an iron works at 503 East 165th Street, is having plans prepared for the construction of a one-story addition, 26 x 130 ft. Improvements will also be made in the existing plant. The work is estimated to cost about \$7,000.

Kahn Brothers, 785 Humboldt Street, Brooklyn, operating a metal working plant, will build a one-story addition, about 145 x 210 ft., to cost \$18,000.

The Miller Carburetor Distributors, Inc., New York, has been incorporated in Delaware with a capital of \$350,000 to manufacture automobiles and motorcycles. Samuel B. Howard and Arthur W. Britton, 65 Cedar Street, New York, are the incorporators.

The Sterling Brass Bed Co., 999 Metropolitan Avenue, Brooklyn, has been consolidated with the White Metal Bed Co., Brooklyn, under the name of the White Metal Bed Corporation, with capital of \$30,000, to manufacture metal beds and cribs. P. Weinberg, J. B. Greenspan and H. Chester, 571 West 175th Street, are the incorporators.

The W. N. Best Smoke Consuming Co., New York, has been incorporated with a capital of \$50,000 to manufacture equipment for smoke prevention. E. S. Hammond, A. H. and W. N. Best, 383 Gates Avenue, Brooklyn, are the incorporators.

The Single Service Package Corporation of America, 326 Hudson Street, New York, has had plans prepared for the construction of a new factory on the Saw Mill River Road, Yonkers, N. Y. Alfred R. Turner is president.

The Baldwin Shipbuilding Co., New Baltimore, N. Y., has been incorporated with a capital of \$250,000. S. and W. H. Baldwin, and B. Naumberg, 30 Broad Street, New York, are the incorporators.

The Morse Chain Co., Ithaca, N. Y., manufacturer of transmission chains, has had plans prepared for the construction of a new four-story addition to its plant on South Tioga Street.

Clemson Brothers, Middletown, N. Y., operating a plant on Cottage Street for the manufacture of hack saws, have been incorporated with a capital of \$2,000,000 by R. D. and G. N. Clemson, and W. H. Cross.

The Crucible Steel Co. of America, Syracuse, N. Y., has awarded a contract for the erection of an addition to its plant on West Fayette Street to cost about \$60,000. The J. D. Taylor Construction Co., 115 South Salina Street, is the contractor.

The Seaboard Barge Co., Monroe, N. Y., has been incorporated with a capital of \$500,000 to build submarines and other vessels. J. A. Anderson, H. R. C. Baird and J. P. Pillow, 420 West 156th Street, New York, are the incorporators.

The T. H. Symington Co., Leighton Avenue, Rochester, N. Y., manufacturer of railway equipment, has had plans

prepared for a one-story addition to be used as a core department.

The Strong Steel Foundry Co., 33 Norris Street, Buffalo, will build a one-story extension, about 20 x 48 ft.

The Perry Motor Boat Co., Buffalo, has been incorporated with a capital of \$50,000 to manufacture motor boats. N. Amigone and J. and P. Orlando, Buffalo, are the incorporators.

The Piston Shockless Spring Co., Buffalo, has been incorporated with a capital of \$75,000 to manufacture springs. H. E. Spangler and A. M. and W. C. T. Suor, Buffalo, are the incorporators.

The John J. McCloskey Co., Collingswood, N. J., manufacturer of cast-steel looms, etc., is planning for extensions to increase the present capacity.

Thomas A. Edison, Inc., West Orange, N. J., manufacturer of talking machines, etc., is having plans prepared for the erection of a new one-story, reinforced-concrete power plant, about 100 x 100 ft.

The Wood-Seal Co., Montclair, N. J., has been incorporated with a capital of \$75,000 to manufacture automobile supplies. W. V. Ash and A. C. Buell, Montclair, are the principal incorporators.

The Metal Shelter Co. of New Jersey, East Orange, has been incorporated with a capital of \$100,000 to manufacture machinery. Allan K. Pruden, Louis Brooks and Isaac Josephson are the incorporators.

W. Ames & Co., 417 Communipaw Avenue, Jersey City, N. J., manufacturers of heavy bolts, railroad spikes, etc., will erect a one-story addition to cost about \$6,000.

The Machine Tool & Engineering Corporation, Jersey City, N. J., has been incorporated with a capital of \$10,000 to manufacture tools and machinery. Fred W. and George W. Rurode, 1 Montgomery Street, and Cornelius S. Edwards, Jersey City, are the incorporators.

The Pennsylvania Railroad, Jersey City, N. J., has filed plans for the construction of a one-story machine shop, one-story blacksmith works, one-story planing mill, two-story office building, and two one-story shops at its Greenville yards to cost about \$46,000.

Louis Sacks, Newark, N. J., operating a foundry at 357-91 Hamburg Place, Newark, N. J., will build a two-story addition, about 37 x 46 ft. to cost \$9,000.

The Miniature Incandescent Lamp Corporation, Newark, has been incorporated with a capital of \$250,000 to manufacture incandescent lamps. C. H. Jarvis, H. A. Black and J. E. Brand are the incorporators.

The Federal Shipbuilding Co., a subsidiary of the United States Steel Corporation, 71 Broadway, New York, has filed notice at Trenton, N. J., of payment of the entire \$3,000,000 capitalization of the company in cash. The company has commenced the construction of a shipbuilding plant on the Newark meadows, to specialize in building all-steel vessels. E. H. Gary is president; William J. Filbert is secretary.

J. Wiss & Sons Co., 31 Littleton Avenue, Newark, manufacturer of cutlery, will build a two-story addition to its forge shop, about 22 x 45 ft.

The New Jersey Optical Co., 126 South Street, Newark, will build a new two-story brick plant, 80 x 100 ft., at Runyon Street and Badger Avenue, to cost about \$50,000.

The United States Internal Combustion Co., Newark, has been incorporated with a capital of \$500,000 to manufacture engines, motors, etc. David and David S. Henney, Montclair, and H. Y. Billings, Mountain Lakes, N. J., are the incorporators.

Oscar Froehlich, Newark, operating a wire works at 51 Bruen Street, has had plans prepared for the erection of a new one-story plant, about 40 x 100 ft., at 676 South Fourteenth Street.

The Hygrade Machinery & Equipment Co., 245 New Jersey Railroad Avenue, Newark, has been incorporated with a capital of \$100,000 to manufacture machinery and electrical specialties. Thomas J. Graves, Frederick A. Holt and Harry A. Emeritz are the incorporators.

The Deslauriers Air Craft Corporation, 233 Broadway, New York, with plant at Newark, is considering the erection of a new five-story concrete addition, about 100 x 200 ft. It has also had plans prepared for the construction of a one-story assembling works, 90 x 240 ft.

The International Time Recording Co., Endicott, N. Y., J. E. Rogers, manager, has completed plans for a factory, 75 x 260 ft., three stories and basement.

The Groton Electric Power Corporation, Groton, N. Y., has been incorporated with a capital of \$20,000 and will construct a power plant. J. B. Carey, O. E. Wasser and F. J. Magee, 622 West 113th Street, New York, are the incorporators.

The General Railway & Signal Co., Rochester, E. E. Jackson, manager, has prepared plans for a power house to be erected at Lincoln Park.

The board of water supply, Olean, N. Y., William Sheehan, chairman, has had plans prepared for a filtration plant with a daily capacity of 2,500,000 gal. and a one-story brick pumping station, estimated to cost \$75,000. Bids will be received about Oct. 20.

Construction has commenced on a one-story addition, 32 x 146 ft., to the plant of the Modern Tool Co., Erie, Pa. L. Orr is manager.

W. W. Wotherspoon, superintendent of public works, Albany, N. Y., is receiving sealed proposals for electrical equipment and machinery for operating and lighting the Utica Terminal lock, Utica, N. Y.

The Bridgeford Tool & Machine Co., Winton Road, North Rochester, N. Y., has had plans prepared for an addition to its plant.

Plans have been prepared for the Bausch & Lomb Optical Co., 1635 St. Paul Street, Rochester, for a five-story factory, 120 x 400 ft., reinforced concrete construction.

The Newark Gear Cutting Machine Co., Newark, of which Henry E. Eberhardt is president, will erect a new four-story building, 40 x 50 ft., which, with the exception of the second floor, will be used as a machine shop. Offices will be located on the second floor. Some new equipment has been bought, but a few additional tools may be required.

The Standard Ordnance Co., 115 Broadway, New York, is in the market for a large quantity of equipment for a factory at Hamilton, Ohio, which will be engaged on Government work.

The Jewell Steel & Malleable Co., 373 Hertel Avenue, Buffalo, N. Y., will build a one-story addition.

The Wire Wheel Corporation of America, 1700 Elmwood Avenue, Buffalo, is having plans prepared for the erection of a new reinforced-concrete plant on Elmwood Avenue. R. N. Reidpath & Son, Builders' Exchange, are the architects.

The Globe Pattern Works, 39 Henry Street, Buffalo, will build a one-story addition, about 32 x 90 ft., on Morris Street, near Hertel Avenue.

The Sebo Co., Inc., Buffalo, has been incorporated with a capital of \$40,000 to manufacture machinery and tools. G. Keller, C. Ulrich and A. Sprenger are the incorporators.

The board of education, Buffalo, will receive bids until 12 m., Oct. 11, for tools and supplies for the manual and vocational training departments of the city schools. James Storer is secretary.

The Pierce-Arrow Motor Car Co., Buffalo, will build four extensions, each about 45 x 234 ft., on Elmwood Avenue.

The Buffalo Metal Goods Co., Buffalo, with plant 196 Winchester Avenue, has filed notice of reorganization, with an active capital of \$157,500.

The American Car & Foundry Co., 370 Babcock Street, Buffalo, will build an extension to its plant on Metcalf Street.

The Buffalo Bolt Co., East Avenue and Oliver Street, North Tonawanda, N. Y., manufacturer of bolts, nuts, etc., will build a one-story addition, about 35 x 80 ft.

The Arrow-Grip Mfg. Co., Glens Falls, N. Y., has been incorporated with a capital of \$40,000 to manufacture non-skid apparatus. C. C. Kelly, W. H. Dennin and E. G. Mertens, all of Troy, are the incorporators.

The Ransome Concrete Machinery Co., Second Street, Dunellen, N. J., manufacturer of concrete mixing machinery, is planning for the construction of a one-story addition, about 25 x 120 ft., to cost \$10,000.

The Coit Machine & Engine Co., 146 Coit Street, Irvington, N. J., is building a new one-story blacksmith works to cost about \$4,000.

The Ford Motor Car Co., Detroit, Mich., is taking bids for the erection of a new four-story brick and reinforced-concrete plant, 375 x 760 ft., to be erected on the Newark Meadows, Kearny, N. J.

The Public Service Electric Co., Terminal Building, Newark, N. J., has been granted permission to issue additional capital stock to the amount of \$5,000,000 for extensions and improvements in its electric power plants and system. N. A. Carle is chief engineer.

The National Iron Works, 370 Halsey Street, Newark, N. J., has been organized to operate a local plant. Gustave A. Hoffman, 892 Hunterdon Street, heads the company.

The Oxford Truck Mfg. Co., Newark, has been incorporated with a capital of \$125,000 to manufacture motor trucks and other vehicles. William W. Schofield and George W. Nuse, Newark; John J. Bush, New York, and Ernest B. Raunser, Brooklyn, are the incorporators.

The H. & L. Novelty Co., 393 Clinton Avenue, Newark,

has been organized to manufacture small hardware and kindred specialties. Richard F. Hackbarth heads the company.

The Newark Steel Post Co., 738 Broad Street, Newark, has been organized to operate a local plant. George T. Prescott is head of the company.

The Lehigh Valley Railroad, Buffalo, will erect a brick boiler house at its shops at South Ogden and Dingens Streets, to cost \$26,000, and a brick boiler house, machine shop, blacksmith shop and storehouse at the foot of Tifft Street, to cost \$50,400.

The Buffalo Nipple & Machine Co., Buffalo, has completed plans for additions to its factory on Glenwood Avenue.

The city and hospital board of managers, Binghamton, N. Y., has let contracts for a boiler house and heating plant at the City Hospital, to cost \$25,000.

The Hornespeed Propelling Co., 302 Main Street, Buffalo, recently incorporated under the laws of Colorado with a capital stock of \$1,000,000, has elected James A. Horne, president and general manager; Jacob P. Jacobson, vice-president and M. J. West secretary and treasurer. The company will manufacture airplanes, under the Hornespeed patents, marine propellers and ventilators and fans. Arrangements are being made for the erection of a factory.

New England

BOSTON, Oct. 8.

During the week the flood of inquiries for machine tools reached an unparalleled height. Orders, however, have not been in greater volume than in recent weeks. The distributors of Western machine tools have been figuring day and night to keep up with estimates asked, but actual sales have been slower than usual. There is every indication that as a result of these inquiries there will eventuate orders in a volume that will mean increased output of the machine tool plants if additional material and supplies can be obtained. There is little worriment about supplies as most of these inquiries are for Government work and materials are promptly forthcoming. Labor is a problem and many factories are handicapped by the number of men answering the draft. The strike situation in a few cities is not serious and such outbreaks are sporadic, as a rule, and short-lived.

The Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., has confirmed the report of its purchase of the Meriden, Conn., plant of the New England Westinghouse Co. and has announced that it will build there the Browning light machine rifle. It is understood that the Meriden plant will continue for the next two months to turn out rifles on a Russian contract, by which time the Colt company will have its tools and jigs ready to take up the manufacture of the Browning gun. The Meriden factory now employs 1700 hands.

The Bilton Machine Tool Co., Bridgeport, Conn., has increased its capital stock from \$600,000 to \$1,000,000.

The Rhode Island Tool Co., Providence, R. I., has awarded a contract for a one-story addition, 32 x 90 ft.

Work has been begun at the Watertown Arsenal, Watertown, Mass., on a foundry, 280 x 300 ft., one story.

The Wizard Foundry Co., North Attleboro, Mass., has begun the construction of a one-story addition, 30 x 100 ft.

The Osgood Bradley Car Co., Worcester, Mass., is inquiring for machine tools for additional equipment to be used in building gun mounts for the Government.

The Eastman Car Co., builder of heated cars, Boston, has been reorganized, control of the company having been secured by Taber D. Bailey and George E. Thompson, Bangor, Me. W. H. Porter, Portland, Me., is also interested in the enterprise. The new officers are George W. Calkins, Boston, president, and George E. Thompson, treasurer. The business will be enlarged.

The Edwin Hills Co., Plainville, Conn., manufacturer of saddlery hardware, will build a three-story addition, 44 x 90 ft., to cost about \$20,000.

The M. S. Little Mfg. Co., Allyn Street, Hartford, Conn., manufacturer of plumbing supplies, has awarded a contract for the erection of a one-story addition to its plant on New Park Avenue, 50 x 225 ft., to cost about \$30,000.

The Terry Steam Turbine Co., Windsor Street, Hartford, Conn., has commenced the erection of a one-story addition, 100 x 108 ft., to cost about \$25,000.

The Millbury Steel & Foundry Co., Millbury, Mass., is building a one-story addition to its foundry, 30 x 120 ft.

W. S. Randall, Portland, Me., and associates, have recently incorporated in Delaware the National Tool & Mfg. Co., with capital of \$100,000 to manufacture tools and machinery.

The Howard & Bullough American Machine Works, Pawtucket, R. I., has awarded contracts for a one-story foundry addition, 35 x 68 ft., a three-story addition to a pattern storage building, 76 x 100 ft., and for an additional story to the present pattern storage building.

The United States Government is to build a machine shop, 95 x 250 ft., two stories, at New London, Conn.

The American Steel & Wire Co., Worcester, Mass., has awarded a contract for a one-story building, to contain about 5600 sq. ft., at its South Works.

The Bowers Arms & Munitions Co., Boston, has been incorporated with authorized capital stock of \$100,000. Thomas A. Bowers is president and Charles W. Poole, Cranston, R. I., treasurer.

The Winchester Repeating Arms Co., New Haven, Conn., has purchased a tract of land on Division Street for future development of the plant.

The American Steel & Wire Co., Fair Haven, Conn., has begun the erection of a number of small buildings, including a zinc refinery, scale house, sanitary building and four motor houses.

The Luster Products Corporation, Bridgeport, Conn., has been incorporated with authorized capital stock of \$25,000 to manufacture hardware and electrical goods. The incorporators are Clarence R. Hall, Grace L. Watt and Mabelle K. Pederson.

The North & Judd Mfg. Co., New Britain, Conn., has issued additional capital stock to the amount of \$250,000. Outstanding stock is \$1,500,000.

The Gallaudet Aircraft Corporation, East Greenwich, R. I., has completed plans for two buildings, 76 x 151 ft. and 52 x 128 ft., respectively, at its plant on Chepiwanoxet Island.

The Millbury Steel Foundry Co., Millbury, Mass., has awarded a contract for a one-story addition, 50 x 64 ft.

The Connecticut Electric Steel Co., Hartford, Conn., has awarded a contract for a one-story addition, 101 x 195 ft.

The Taunton-New Bedford Copper Co., Taunton, Mass., has awarded a contract for a machine shop, 60 x 100 ft., one story.

The Gem Mfg. Co., Boston, has been incorporated with authorized capital stock of \$25,000 to manufacture metal specialties. Frederick W. Dunn is president and Miriam Scouller, Wakefield, treasurer.

The Marlin-Rockwell Co., New Haven, Conn., has secured permits for the erection of five small additions, including a machine shop and a heating plant.

The Chase Rolling Mill Co., Waterbury, Conn., has received a permit to move two buildings. The site will be used for a new factory building.

The North & Judd Mfg. Co., New Britain, Conn., has plans for a two-story factory building to cost about \$40,000.

Butterfield & Co., Derby Line, Vt., have awarded a contract for a three story factory building, 60 x 77 ft.

The Commercial Iron & Metal Co., Fifth Street, Waterbury, Conn., is building a two-story addition, about 44 x 44 ft., to cost \$6,000.

Clifford S. Kilbourn, 264 County Street, New Bedford, Mass., has acquired property on East French Avenue and will establish a boat-building and repair works.

Philadelphia

PHILADELPHIA, Oct. 9.

This market is interested in the forthcoming lists of the New York Shipbuilding Corporation, Camden, N. J., for equipment, including many machine tools, plate-working machines, cranes, etc., for expansion of its plant for building torpedo boat destroyers. The American International Corporation continues an active buyer of miscellaneous equipment.

The Marlin-Rockwell Corporation is buying additional equipment for its Standard Roller Bearing plant.

The Penn Seaboard Steel Corporation has closed with Alfred Box & Co., Philadelphia, for three 30-ton traveling cranes for its new steel foundry to be built at Chester, Pa.

The Tucker Supply Co., York, Pa., which has a contract for gun sights for one of the large gun manufacturing companies, has acquired a building formerly used as a shoe factory and will alter and equip it for the gun sight work. The Tucker Supply Co. has also taken over the plant of the Weidman Whor Machine Co., Lancaster, Pa., and will use this plant for the manufacture of supplies for the Navy.

The Tacony Ordnance Co., Philadelphia, has awarded a contract for the erection of its proposed new works to the

F. W. Mark Construction Co., Finance Building, at a cost of \$450,000. The plant will be located at Tacony and will consist of a one-story open-hearth building, 105 x 189 ft.; one-story machine shop, 130 x 270 ft.; one-story forge shop, 126 x 210 ft., and heat treating works, 100 x 135 ft.

The Baldwin Locomotive Works, Philadelphia, has awarded a contract for the construction of an addition to its rivet tower works, 44 x 74 ft., at a cost of \$60,000. The McClinic-Marshall Co. is the contractor.

The Keystone Needle Works Co., Philadelphia, has been incorporated with a capital of \$30,000. Angelo Gambine is the principal incorporator.

The Fort Mifflin Shipbuilding Co., Philadelphia, incorporated with a capital of \$10,000,000, has perfected plans for the construction of a shipbuilding plant on the Delaware River, near League Island, Philadelphia. The initial works will consist of shipways for 16 vessels, machine shops, brass and iron foundry, boiler works, blacksmith shop, wood-working plant, etc. An industrial railway will be installed, as well as a series of traveling cranes. Arthur Masters is president; Henry D. Bacon, vice-president, and J. M. Cardeza, treasurer. Leonard E. Harris is consulting engineer.

J. Picucci, 1333 Reed Street, Philadelphia, will build a one-story machine shop, about 20 x 38 ft., at Fifteenth and Reed Streets.

The Philadelphia Supply Mfg. Co., Philadelphia, manufacturer of package handles, etc., has increased its capital from \$5,000 to \$70,000, and changed its name to the Shuttleworth-Gallen Co.

The Unit Construction Co., Thirty-first and Chestnut Streets, Philadelphia, has awarded a contract for the erection of a new plant at Gray's Avenue and Fifty-eighth Street to consist of a three-story building, 80 x 240 ft., and one-story structure, 60 x 60 ft., to cost about \$80,000. Guns for the Government will be manufactured.

The Gara-McGinley Co., Philadelphia, operating a sheet metal works, has recently reorganized and removed its plant from 1631 to 1708-10 Ludlow Street. It will specialize in the manufacture of roofing and kindred products.

Fire Oct. 2 destroyed the three-story plant of the Central Stove Repair & Foundry Co., 2318 Washington Avenue, Philadelphia, manufacturer of stoves and ranges, with loss estimated at \$25,000. Thomas McCaffrey heads the company.

The Empire Rubber & Tire Co., North Clinton and Mulberry Streets, Trenton, N. J., has commenced the construction of a one-story addition, about 90 x 320 ft., to cost \$40,000.

The McLaughlin Tool Co., Camden, N. J., has been incorporated with a capital of \$50,000 to manufacture tools. James Scott, 549 North Second Street; W. J. McLaughlin and William J. Strandwitz, Camden, are the incorporators.

The Strandwitz & Scott Co., Camden, N. J., manufacturer of oil guards, tanks, etc., has completed the erection of a new plant on South Second Street.

The Aluminum Brazing Co., 628-30 Penn Street, Chester, Pa., has had plans prepared for the erection of a new one-story plant, 35 x 60 ft., at Third and Tilghman Streets.

Walter Butz, Norristown, Pa., has acquired property on Kohn Street and will establish a plant for the manufacture of hedge trimmers, cloth cutters, etc.

The Badenhausen Boiler Co., Cornwells, Pa., will build a new one-story plant, 200 x 230 ft., to cost about \$50,000.

The Lycoming Foundry & Machine Co., Williamsport, Pa., operating a plant at Oliver and High Streets for the manufacture of gas and gasoline engines, etc., has purchased the plant of the United States' Machine Co., Southern Avenue, South Williamsport. The present equipment will be removed from the works and the plant converted into a foundry for increased capacity. The company specializes in the manufacture of automobile motors.

The Belmont Motor Co., Union Trust Building, Harrisburg, Pa., has acquired the plant of the North American Tannery, Lewistown, and will remodel and equip the works for an automobile manufacturing plant. It is said that about 500 hands will be employed for initial operations.

The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., has received a Government contract for about 1,000,000 4-in. steel castings for shells and will devote its works in three daily shifts to this production.

The Brown Instrument Co., Philadelphia, has purchased additional property adjoining its factory on which it intends to make extensions from time to time required by the growth of its business. R. P. Brown is president.

The White Motor Car Co., 216 North Broad Street, Philadelphia, will build a one-story service and repair plant at Twentieth Street and Erie Avenue, which will provide about 10,000 sq. ft. of floor space. J. D. Howley is manager.

The Industrial Foundry & Machine Co., Pottstown, Pa., will build a new one-story pattern shop, about 30 x 30 ft.

Baltimore

BALTIMORE, Oct. 8.

The McNamara Brothers Co., Inc., Ranstead's Wharf, Baltimore, manufacturer of tanks and boilers, has awarded a contract to the J. L. Robinson Construction Co. for the construction of an addition to its plant at Bush Street and the Baltimore & Ohio Railroad.

The Baltimore Tube Co., Wicomico and Ostend Streets, Baltimore, Md., will build a one-story machine shop to cost about \$20,000. The contract has been awarded the West Construction Co., American Building, Baltimore.

The Kelly-Springfield Tire Co., Akron, Ohio, has approved final plans for the construction of a new plant at Cumberland, Md., to cost about \$5,000,000, or about double the amount of investment heretofore considered. The works will consist of a one-story machine shop, 100 x 150 ft.; main building, about 700 x 900 ft.; electric power house, 150 x 150 ft., and other structures. The plant will have a capacity of about 400,000 tons per year. The machinery and equipment will cost about \$1,000,000, for which some contracts have been awarded. S. Diescher & Sons, Farmers Bank Building, Pittsburgh, Pa., are consulting engineers.

The Bureau of Yards & Docks, Washington, D. C., is preparing plans for the erection of a one-story machine shop, one-story forge shop, five-story pattern shop and wood-working plant, and one-story brass foundry. F. R. Harris is chief of the Bureau.

The Maryland Brass & Metal Works, Guilford Avenue and Federal Street, Baltimore, is completing the construction of a new brass foundry, about 46 x 90 ft., costing \$15,000.

The Crescent Iron Works, Elkton, Md., has been incorporated with a capital of \$100,000 to operate an iron foundry. Clement M. Egner is the principal incorporator.

The York River Shipbuilding Corporation, Mutual Building, Richmond, Va., has commenced the construction of a new plant on the Mattapani River, near West Point, Va., to cost about \$250,000. The initial works will consist of 10 buildings and an electric power plant.

The A. J. Chesson Agricultural Co., Kinston, N. C., manufacturer of farming equipment, is considering the erection of a new plant to cost about \$50,000. A. J. Chesson is president.

The Piedmont Motor Car Co., Lynchburg, Va., is planning for extensions to its plant to include a department for the manufacture of automobile bodies.

The Indian Block Machine Corporation, Bristol, Va., has been incorporated with a capital of \$25,000 to manufacture machinery. Richard Burson and George M. Turner, Bristol, are the principal incorporators.

The Colle Muffler & Safety Valve Co., 325 East Oliver Street, Baltimore, will build a two-story addition to its machine shop, 50 x 150 ft.

The Maryland Metal Cross Tie Co., Munsey Building, Baltimore, will purchase a site at Havre de Grace, Md., for the erection of its new one-story plant, 200 x 400 ft., to cost about \$100,000.

Chicago

CHICAGO, Oct. 8.

Big things are stirring in this market, all of them having to do with war requirements of which there is hesitancy to talk. Many inquiries from the East are coming to hand, on some of which dealers cannot quote because of territorial reasons, to say nothing of their inability to give the desired deliveries. In several instances machines which have been on order for some time and heretofore intended for private buyers have been commandeered by the Government. A railroad for which a 90-in. boring mill was built did not get the machine for this reason. It is regretted in some quarters that the Government does not, to some extent at least, dispense with its elaborate specifications and send men who know machine tools into the field to place orders in much the same manner as did the foreign Governments at the outset of the war, a plan being followed by the large contractors doing Government work.

One of the large outside inquiries before the trade is for machines needed in the establishment of a repair base in France. A Pottstown, Pa., company has sent inquiries to Chicago for equipment required to set up a complete plant for the manufacture of 6-in. shells. No additional shell orders have been placed in this district. The Rock Island Arsenal continues to buy on an extensive scale, as does the Nordyke & Marmon Co., Indianapolis, Ind., one of its recent orders calling for 15 large turret lathes. It is erecting a large new plate for the manufacture of Liberty airplane motors.

Skilled labor is becoming an even more serious problem

than it has been heretofore. Good men are sought eagerly, and high wages are offered. That such men must be exempt from military duty is undisputed.

Steps have been taken, but the proposition is as yet entirely in a formative stage and largely dependent on financing, for the organization locally of a company to build tools essential in the making of large guns. There is a tremendous demand for shipyard equipment, some of it coming from Japan, in fact all sorts of large tools are quickly snapped up. Meanwhile the business which dealers are doing where they can make deliveries from stock is of a very satisfactory character.

Bids will be taken Oct. 16 by G. C. Nimmons & Co., architects, 122 South Michigan Avenue, Chicago, on an eight-story reinforced concrete factory, 100 x 100 ft., at Kinzie and Franklin Streets, to cost \$125,000, for the Union Special Machine Co., 300 West Kinzie Street.

Plans for the four-story and basement factory, 51 x 112 ft., which is to be built at Twenty-seventh and La Salle Streets for the Ehman Tire & Rubber Co., 142 West Twenty-seventh Street, are being revised. A. C. Ehman is president.

The Peerless Tool Co. has had plans prepared for a one-story factory, 50 x 120 ft., at 2450 West Forty-eighth Street, Chicago. McKeown Brothers, 112 West Adams Street, have the contract.

Miller & Hall, architects, 204 North Karlov Avenue, Chicago, are preparing plans for a one-story factory, 75 x 105 ft., on the West Side, to cost about \$15,000. The owner's name is not given.

The Zin-Ho Mfg. Co., manufacturer of portable air compressors, has purchased from the Briggs-Chicago Co. its plant at North Chicago, comprising three acres, with buildings, machinery, etc., at a reported price of \$40,000. It is said the purchasing company has Government contracts.

The Illinois Steel Co. is erecting a one-story brick shop at a cost of \$10,000.

The Chicago Short Line Railway Co. will erect a one-story brick repair shop, 113 x 150 ft., in South Chicago, to cost \$15,000.

A committee of six, all creditors of the Smith Motor Truck Corporation, maker of the Smith Form-a-Truck, has been appointed to take charge of the creditors' interests of the company. It is stated by D. W. Figgis, president, that injudicious buying by the former company has caused an over supply of material, and it had been unable to meet its obligations. The company's assets are reported to be \$1,634,786 in excess of the liabilities, which amount approximately to \$1,700,000. The committee has worked out a plan for the continuance of operations. The factory is at Clearing, and head offices at Sixteenth Street and Michigan Avenue, Chicago.

The new plant, 80 x 250 ft., which the Buda Co. is building at Harvey, Ill., will be used for the manufacture of gas engines for auto truck tractors.

The Atchinson, Topeka & Santa Fe Railroad, Chicago, has commenced the erection of a one-story addition, 108 x 580 ft., to its car shops at Ottawa, Kan., to cost \$45,000. R. A. Rutledge, Topeka, Kan., is chief engineer.

The Octigan Drop Forge Co., Lowe Avenue, Chicago, will build a new one-story machine shop, 50 x 100 ft.

The Electric Machinery Co., Minneapolis, Minn., has begun work on a new factory, considerably larger than its present one, to be built adjoining the present main building. This will make the complete plant more than twice its former size and will so increase the shop facilities that the company will be able to triple its output. The new factory will be completed and in operation before Jan. 1. Among the new equipment to be bought are a 4-motor 25-ton traveling crane, with 60 ft. span; several 16-ft. boring mills and lathes, milling machines, punch presses, drill presses, etc. The company has established a branch office in New York City, with district offices in Boston, Philadelphia and Buffalo. Orders which the company has received for vertical generators, synchronous motors and standard alternators are far larger than the present capacity of the plant will admit, and the new factory will make it possible to give earlier deliveries. Truman H. Hibbard is vice-president and general manager.

The Albert-Lea Sprayer Co. is not located in Minneapolis, Minn., recently mentioned in THE IRON AGE, but at Albert Lea, Minn.

The Strite Tractor Co., Minneapolis, Minn., has been incorporated in Delaware with a capital of \$5,000,000 to manufacture tractors and farming machinery. G. H. Strite and F. H. Bierman, Minneapolis, are the incorporators.

The Toro Motor Co., University Avenue, Minneapolis, Minn., is taking bids for the construction of a new one-story machine shop, 75 x 190 ft., on Snelling Avenue, to cost about \$30,000.

The Sta-Rite Hairpin Co., Findlay, Ill., has been incor-

porated at Washington, D. C., with a capital of \$500,000 to manufacture hairpins and metal specialties. Eugene Bland, Findlay; Isaac B. Craig, Mattoon, Ill., and Norman T. Whitaker, Washington, are the incorporators.

The Kelly-Atkinson Co., Chicago, Ill., has commenced the erection of machine shops to cost about \$50,000 at its proposed new shipbuilding plant at Mobile, Ala.

Milwaukee

MILWAUKEE, Oct. 8.

The demand for machine-tools continues at a high rate from scattered sources, and the urgency of needs leaves no hope that manufacturers will be able to make any gains on deliveries before the end of a year or longer. This is particularly true of milling machines, for which the gas engine industry is probably the heaviest purchaser, due to the enormous demands of the war for motive power.

Activity in all manufacturing lines is the greatest ever known and the total capacity of plants is by no means sufficient to absorb all requirements. The prohibitive cost of building materials, and the small supply, together with the acute shortage of skilled and semi-skilled labor, makes it difficult to provide the required enlargements of facilities.

A number of hydroelectric and steam generating power plants throughout Wisconsin are making extensive improvements which have been held off due to heavy costs.

The Cruiser Motor Car Co., Madison, Wis., will award contracts within 10 days for the erection of the first unit of its plant. A two-and-one-half acre site on East Johnston Street and the Milwaukee road tracks has been purchased. A combination touring-camping automobile will be manufactured.

The Pawling & Harnischfeger Co., Milwaukee, maker of electric traveling cranes, is preparing to erect another machine-shop extension, 50 x 160 ft. It is completing work on a 500-kw. power plant addition. O. A. Ruemelin is vice-president and general superintendent.

The Western Rope & Mfg. Co., Tulsa, Okla., which recently purchased the plant of the Schneck Machine Co., 809-811 St. Paul Avenue, and additional acreage, has awarded contracts for the first of a series of shop additions. The new building will be 50 x 110 ft., one-story, of reinforced concrete and brick, and cost about \$25,000 with equipment. Gas engines and boilers will be manufactured. James K. Bradley is works manager.

The Badger-Packard Machinery Co., 133-139 West Water Street, Milwaukee, manufacturers of machine-tools, mill and factory equipment, has increased its capital stock from \$75,000 to \$200,000 to accommodate the growth of its business. L. Kurtz is president and W. L. Romaine is secretary.

The Prest-O-Lite Co., Indianapolis, Ind., has moved its Milwaukee branch from 18-20 Martin Street to 528-532 Milwaukee Street. C. L. Myers is division manager.

The Milwaukee Plate & Stamping Co., Milwaukee, has been incorporated with a capital stock of \$25,000 by P. M. Dreher, A. G. Staab and P. M. Hoppe.

The Stowell Co., South Milwaukee, Wis., has awarded the general contract for the erection of an addition to the grinding and annealing room to C. B. Danielson, 2415 Prairie Street, Milwaukee, to cost about \$20,000 complete.

The La Pointe Foundry Co., Schlesinger'sville, Wis., will increase its capacity from 50 to 75 per cent by installing an additional furnace, and has leased a building from the Standard Machinery Co. to provide much-needed floor space.

The Economy Paper Products Co., Milwaukee, has been incorporated with a capital stock of \$100,000 and will erect a plant at 315 Wright Street to cost \$50,000. The promoters are Arthur F. Tiegs, John T. Arveson, Robert Vochel and John Martin. An architect and engineer have not yet been selected.

The board of education, Bessemer, Mich., has engaged John D. Chubb, architect, 109 North Dearborn Street, Chicago, to prepare plans for a two-story vocational training and graded school building, 170 x 200 ft., costing \$125,000. Manual training and domestic science equipment will be required. W. V. Trueitner is secretary.

The Atlas Foundry Co., Milwaukee, has been organized with a capital stock of \$10,000 and will establish a gray-iron foundry in a plant, 80 x 120 ft., at Thirty-ninth Avenue and Burnham Street, West Milwaukee. George P. Gerlinger, vice-president of the Gerlinger Steel Casting Co., Orvel A. Meyer and Bertha Gerlinger are the incorporators. A 3-ton cupola is being installed and a general line of machinery castings will be manufactured. Mr. Meyer, who comes to Milwaukee from La Salle, Ill., will be manager.

The Kiel Woodenware Co., Kiel, Wis., will erect a one-story extension, 80 x 320 ft., in addition to the enlargement of its steam generating plant, to cost from \$65,000 to \$75,000.

Plans are being prepared by the Thomas S. Watson Co., consulting engineer, Majestic Building, Milwaukee.

The Hellwig Carburetor Co., Milwaukee, has been incorporated with a capital stock of \$30,000 to manufacture gas engine devices and parts. The incorporators are Frank L. McNamara, Harold W. Connell and John F. Hurley, members of a law firm at 800 Pabst Building.

The Rock River Valley Hemp Mills, Waupun, Wis., will erect a power house addition, 30 x 30 ft., for which a 150-hp. boiler will be needed.

The C. H. & E. Mfg. Co., Milwaukee, has awarded the general contract for a two-story shop addition, 50 x 100 ft., at Clinton and Mineral Streets. It manufactures gas engines, concrete mixers, power hoists and other contractors' equipment. F. F. Hase is general manager.

The Electric Specialty Co., New London, Wis., has been incorporated with a capital stock of \$100,000 by F. A. Archibald, George T. Dawley and Roman Helman.

The Morton Brake Co. of Wisconsin, Milwaukee, has been incorporated with a capital stock of \$25,000 by J. A. Barry, G. W. Miller and I. R. Houtcamp.

The Skidd Mfg. Co., Kenosha, Wis., maker of pasteurizing and dairy machinery, has removed its headquarters from Kenosha to Janesville, Wis. The plant recently was transferred to Janesville.

The board of education, Wausau, Wis., has engaged Swarthout & Spear, architects, Wausau, to prepare plans for a vocational training and graded school to cost in the neighborhood of \$200,000. Contracts will be awarded about Jan. 1.

The Waukesha Safety Truck Brake Co., Waukesha, Wis., has perfected its organization and is preparing to establish a factory for the production of a front-wheel braking system for motor trucks. F. H. Halladay, Appleton, is secretary and general superintendent.

The Crank-Shaft Movement Corporation, Green Bay, Wis., has been incorporated with a capital stock of \$300,000, to manufacture a special motor, said to be adaptable for use in automobiles, aircraft, boats, etc. Great economy of fuel is claimed for the new engine.

The Spring Bearing Truck Co., Milwaukee, has leased the plant formerly occupied by the Northwestern Bridge & Iron Co., and will shortly commence the manufacture of small gray iron castings. J. George Shaw is president.

Detroit

DETROIT, Oct. 8.

The machine tool market in this district continues to show improvement. With Detroit now filling nearly \$300,000,000 in war contracts, manufacturers, especially in metal lines, are working to capacity and are unable to keep up with orders.

A. A. Templeton, president Detroit Seamless Steel Tubes Co.; Alvan Macauley, president Packard Motor Car Co.; Henry W. Hoyt, vice-president Great Lakes Engineering Co.; Roy F. Chapin, president Hudson Motor Car Co.; Harry W. Ford, president Saxon Motor Car Co., and other prominent Detroit men, have organized a company with a capital of \$2,000,000 and entered into a contract with the Government for the year ending Oct. 1, 1918, to manufacture a part of the mechanism for large artillery, which calls for about \$30,000,000 worth of equipment. Efforts are being made to obtain a building which will provide immediate working space for 3000 men and 10,000 later on. In case present negotiations are not carried through, a new factory will be rushed to completion. It is stated that the contract for succeeding years will exceed the \$30,000,000 one placed for this year.

The shortage of coal in this district has forced several plants, including the Michigan Malleable Iron Co., to close. Government action promises no relief for some time. In the meantime manufacturers are borrowing coal from one another in an attempt to keep their industries running. Nearly 1000 cars of coal are needed daily in Detroit to prevent the closing of more plants.

The Buhl Stamping Co., manufacturer of light metallic stampedware, Detroit, is operating its new plant, which represents an investment of \$500,000, and is located on the east side of Scotten Avenue, on the Michigan Central Railroad.

The Walcott Lathe Co., Jackson, Mich., has purchased 85,000 sq. ft. of property north of its present plant and will build additional shops, it is expected, in the spring. M. C. Townley and Dean G. Kimball are the principal owners.

Contracts have been awarded for the rebuilding of the foundry of the Morency-Van Buren Co., Sturgis, Mich., which was recently destroyed by fire.

Cleveland

CLEVELAND, Oct. 8.

The demand for machine tools continues active, being almost entirely for Government work. Considerable small lot buying is noted for filling Government orders, as there are but few metal working plants in the Central West not doing work of this kind, either directly or indirectly. Among new inquiries is one from an Ohio manufacturer for 145 standard machine tools, largely lathes and milling and drilling machines in medium sizes. No details are available as to the purposes of this machinery, but it is assumed it is also needed for Government work. A large list of machinery for shell work is expected shortly from the Erie, Pa., plant of the American Brake Shoe & Foundry Co. Another inquiry has come from the Government for about 25 turret lathes, and a company in Detroit is inquiring for 10 or 12 screw machines for making fuse parts of high explosive shells.

The Forest City Machine & Forge Co., Cleveland, is erecting a three-story brick, steel and glass addition. The plant, which is devoted entirely to the making of detonators, has recently received an order from the Government for 2,300,000 detonators for 3 and 4-in. shells.

The Cleveland Ordnance Co., which has been figuring on additional machinery equipment for some time, is expected to place orders shortly for machines for forging, rough turning and boring 3 and 4-in. guns.

The National Lamp Co., Cleveland, a subsidiary of the General Electric Co., will erect a new three-story brick, steel and glass factory, 145 x 267 ft., to be known as the Pitney glass works. Contract has been placed with the Heller Brothers Co., Youngstown.

The Clay Engine Mfg. Co., Cleveland, has been incorporated with a capital stock of \$65,000 by J. N. Halls and others.

The Dual Carburetor & Mfg. Co., Cleveland, has been incorporated with a capital stock of \$100,000 and contemplating establishing a plant to manufacture carburetors. George F. Hart and others connected with the Guardian Savings & Trust Co., Cleveland, are interested.

The Atlantic Foundry Co., Cleveland, has increased its capital stock from \$100,000 to \$150,000.

The American Brake Shoe & Foundry Co., Erie, Pa., is enlarging its plant by an extension 210 ft. x 670 ft. to increase its capacity for shell work. A large list of machinery requirements is in preparation and is expected to be sent out shortly. While engaged a few months ago in the manufacture of shells for the Allies, employment was furnished to 6000 men working in three 8-hr. shifts. It is stated that with the enlarged plant about 8000 men will be employed.

In addition to carrying out its other extensive building program in Erie, Pa., previously announced, the General Electric Co. is planning the erection of a large power house.

The American Clay Machinery Co., Bucyrus, Ohio, will erect addition to its plant to cost \$200,000, and the Allen Motor Co., Bucyrus, will erect an addition at a cost of \$100,000. The Bucyrus Chamber of Commerce has just completed a successful campaign for securing stock subscriptions amounting to \$300,000 for these enlargements.

The Bucyrus Steel Co., Bucyrus, has been incorporated with a capital stock of \$50,000. It is understood that the American Clay Machinery Co. of that city is back of the new company which contemplates erecting a plant.

It is announced that the Trust Concrete Steel Co. will expend nearly \$400,000 for additions to its Detroit, Mich., and Youngstown, Ohio, plants. Two buildings will be erected at Youngstown, one 80 x 400 ft., and the other 65 x 500 ft.

The Canton Rim Co., Canton, Ohio, expects to begin the erection of a plant shortly. W. T. Beardsley is president.

Cincinnati

CINCINNATI, Oct. 8.

Recent changes in the export embargo list include the larger sizes of boring and turning mills, lathes from 30-in. up and planers of stipulated sizes. Local machine tool builders have a number of orders now under way for foreign customers, but do not anticipate any trouble getting permits to ship the machines when finished. The demand for machine tools is more than sufficient to keep all plants busy, so that if the export business were cut off entirely enough domestic orders are booked to keep them running full time. Orders from both Italy and Spain have been coming in freely for lathes, mostly of the smaller sizes, a few shaping machines and a large number of portable electric drilling machines. An order was received last week through a New York exporter for small woodworking machinery to be shipped to Spain, including a number of electrically-driven swing saws.

No changes in machine tool prices are expected on account of the readjustment of the pig-iron figures. The difference in cost will hardly make up for increased manufacturing expenses that have not yet been taken care of.

The Ideal Welding Co., Cincinnati, has leased a building at Eighth Street and Broadway that will give it more space.

The Charles Boldt Paper Mills Co., Cincinnati, has been incorporated with \$1,000,000 capital stock by Charles Boldt and others. It recently finished a plant for the manufacture of corrugated paper, and intends to build an addition at an early date.

The American Valve & Meter Co., Cincinnati, will erect an addition to its plant on Spring Grove Avenue, estimated to cost \$10,000, to be used mostly for storage purposes.

The American Caster Co., Hamilton, Ohio, has been incorporated with \$20,000 capital stock by E. T. Malloy and others. Manufacturing plans have not yet been given out.

It is reported that manufacturers in Dayton, Ohio, are preparing to commence work on contracts for shells that will aggregate \$20,000,000, including a large number of shrapnel shells, in which several Dayton manufacturers have had considerable experience.

The Miami Tool & Die Co., Dayton, has been incorporated with \$35,000 capital stock by George E. Keller, Milton Stern, and others. Manufacturing plans are not yet available.

The Springfield Millwright Co., Springfield, Ohio, has been incorporated with \$15,000 capital stock to do general machine-shop work. It has taken over the shop at 22 South Lowry Avenue, heretofore operated by G. A. Bauer, who is one of the principal incorporators.

The Federal Chemical Co., Columbus, Ohio, is reported to have plans under way for a \$250,000 sulphuric acid plant to be operated in connection with its fertilizer plant on Bonham Avenue. The executive offices are at Louisville, Ky.

The Capital Die, Tool & Machine Co., Columbus, has been incorporated with \$10,000 capital stock by R. B. Ralston and others.

New machinery is now being installed in the six-story plant of the Sayers & Scovill Co., Cincinnati, recently enlarged and remodeled. A new power plant is included in the list of improvements.

The Northside Tool Co., Dayton, Ohio, has been incorporated with \$20,000 capital stock by George Serapin, C. R. Miller and others.

The Wapakoneta Mfg. Co., Wapakoneta, Ohio, has been incorporated with \$50,000 capital stock by Frank W. Andrews and others. It will manufacture fire extinguishers.

The Central South

LOUISVILLE, Oct. 8.

Inquiries for boilers and ice-making machinery continue numerous, with orders depending more upon delivery than upon prices. The demand for hoisting equipment and supplies for oil fields is increasing.

The Roy C. Whayne Supply Co., Louisville, is in the market for an 8 to 12-ton, 220 volt, three-phase, 60-cycle electric hoist.

The Southern Engine & Boiler Mfg. Co., Jackson, Tenn., has been incorporated with capital stock of \$5,000 by J. T. Murdock, Charles M. Morris, Frank W. Milborn, W. H. Biggs and B. F. Ledgar, practically all of whom are interested in the Southern Engine & Boiler Works, Jackson.

Indianapolis

INDIANAPOLIS, Oct. 8.

The Lincoln Motor Truck Co., Anderson, Ind., has been organized to manufacture motor trucks and will occupy part of the factory buildings of the Spring Steel Fence Co. The directors are Robert J. Walker, Michael G. O'Brien, Anderson, and Ernest Bartsch, Detroit.

The Premier Motor Co., Indianapolis, has obtained a \$15,000,000 contract to build motor trucks for the Government. E. W. Steinhart is vice-president and general manager. The company will increase its force to 2500 men.

The National Accessories Co., Indianapolis, has been incorporated with \$60,000 capital stock to manufacture mechanical and electrical devices. The directors are Joseph A. Martz, Elmer P. Warren and Will H. Remy.

The Indianapolis Cordage Co., Indianapolis, has been incorporated with \$700,000 capital stock to manufacture cordage and agricultural implements. The directors are Albert E. Scheithe, George R. Seeger, Orna D. Stoler, Charles E. Sullivan and Fred A. Doll.

The O. L. Colvin Peerless Mfg. Co., Indianapolis, has been incorporated with \$25,000 capital stock to manufacture ma-

chinery. The directors are O. L. Colvin, George K. Brown-ing and Thad F. Thompson.

The Safitary Catch Basin Co., Indianapolis, has been incorporated with \$50,000 capital stock. The directors are Allen Boulds, Hyman Stein and John M. Gray.

The Gary Motor Truck Co., Gary, Ind., has doubled its capital stock by issuing \$75,000 of preferred.

The General Advertising Plate Co., Terre Haute, Ind., has been incorporated with \$50,000 capital stock to manufacture electrotypes and printers' supplies. The directors are Jesse W. Cornelius, A. W. Zinsz and H. W. Moore.

The Standard Ignition Co., Elkhart, Ind., has been incorporated with \$200,000 capital stock to manufacture magneto and other electrical devices. The directors are Andrew H. Beardsley, Martin E. Crow, William H. Foster, John F. O. Stratton and Edward D. Zigler.

The Hiatt Mfg. Co., Winchester, Ind., has been sold to the Imperial Electric Co., Union City, Ind., and the plant will be moved there.

St. Louis

ST. LOUIS, Oct. 8.

The Hope Cotton Compress Co., Hope, Ark., has been incorporated with a capital stock of \$100,000 by C. H. Crutch-field, J. P. Brundidge, E. S. Greening and others.

The Kansas City Railways Co., Kansas City, Mo., will equip a sub-power station requiring about \$16,000 worth of machinery.

The Kansas City Light & Power Co., Kansas City, are preparing plans for a new power plant at a cost of \$3,000,000 to \$5,000,000. Two 20,000 kw. generators are included.

J. M. McGowan and H. J. Deboe will build a machine shop to replace the one recently destroyed by fire.

The Coco System, Clarksdale, Miss., has been incorporated with a capital stock of \$100,000 by H. R. Bynum and H. M. Waddell to equip a plant for manufacturing heating systems.

The Interstate Car Co., Mobile, Ala., has purchased the Armour Car Works at Meridian, Miss., and will install equipment to increase the capacity.

The Old Forge Landing Iron & Steel Co., St. Louis, has been incorporated with a capital of \$500,000 by R. O. Smith, W. C. Kitchin and J. C. Pratt and will erect a plant.

The Louisiana Consolidated Oil & Refining Co., Shreveport, La., has been incorporated with a capital stock of \$1,500,000 by J. C. Ellis and others.

The Marland Pipe Line Co., Ponca City, Okla., has been incorporated with a capital stock of \$200,000 by E. W. Mar-land, J. S. Alcorn and A. L. Bogan and is in the market for pumping equipment.

The Nunn Electric Co., Oklahoma City, Okla., has been incorporated with a capital stock of \$125,000 by O. T. Jenkins, Oklahoma City; Galen Crow, Guthrie, Okla., and J. E. Nunn, Amarillo, Tex., to manufacture electric fixtures.

The Marine Paint Co., New Orleans, La., 411 South Peters Street, has increased its capital from \$50,000 to \$500,000, and will erect a plant to manufacture and grind marine paint.

The K. C. Four Drive Sales Co., Kansas City, has been incorporated with a capital stock of \$250,000 by Louis M. Neale, John L. Peak and B. F. Street to manufacture tractors.

Lumberton, Miss., is in the market for crude oil engines, pumps and other power equipment for its waterworks plant. X. A. Kramer, Magnolia, Miss., is the engineer.

The St. Louis Machine Tool Co., South Broadway, St. Louis, has commenced the construction of a three-story machine shop, 40 x 165 ft., to cost about \$15,000.

California

SAN FRANCISCO, Oct. 2.

The return of machinists and iron workers to work, after a two weeks' strike, has caused a resumption of activity in practically all the shipyards and machine shops. This return to work is in the nature of a truce, pending negotiations between the conflicting parties, with the Government as mediator. It is generally considered that a permanent agreement ratified between employers and employees will make for an increased business of an extent not possible as long as the industrial situation remains unsolved. Inquiries for railroad equipment are numerous enough to warrant the belief that some railroad construction may soon take place. Orders for marine and stationary pumps and tractors have lately been received in greater number than they can be turned out. Many are for Government requirements, but the majority represent the needs of individual buyers.

The American Machine Works, Oakland, will erect a factory, 50 x 100 ft., at a cost of \$30,000.

P. Kirchbaum and S. Grant, Sacramento, will erect a two-story building at Tenth and R Streets and will install machinery for handling and remodeling scrap iron at a total cost of \$48,000.

The Dalton Iron Works, Oakland, has been incorporated with a capital of \$50,000, by Frank N. and Henry P. Dalton, and Robert P. Kavanagh, to build ships and farm implements.

The Sommarstrom Shipbuilding Co., San Francisco, has been incorporated with a capital of \$250,000, by M. F. Sommarstrom, Charles L. Tilden, Henry R. Ridgeway, William H. Fuller and A. F. Lemberger, to build ships.

The Liberty Iron Works, Sacramento, has been incorporated with a capital of \$280,000 by O. A. Robertson, H. S. Wanzer, J. M. Henderson, Jr., J. H. Stephens and C. A. Elliott to build aeroplanes.

Bids are being asked by the Board of Public Works, Los Angeles, for one 800-lb. steam hammer for immediate delivery.

A. F. Katzenstein and John Birdwell, Las Cruces, N. M., will erect a machine shop and garage.

The Fulton Shipbuilding Co., Los Angeles, will erect machine shops and marine ways on land acquired on Los Angeles harbor.

S. Yamamoto, San Pedro, will erect a boat-building plant at Fish Harbor at a cost of \$5,000.

The New York, San Francisco & HongKong Steamship Co. has bought 10 acres at Redwood City and will, it is understood, erect a shipbuilding plant with a capacity of six ships at one time.

The machine shop of the Standard Oil Co., Taft, which was recently burned, will be rebuilt on a larger scale.

The Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, has awarded contracts for its new car shops at Torrance. It has a site of about 125 acres to allow for expansion. The structures will be of steel and reinforced-concrete and be equipped to handle heavy car work. A temporary building, 75 x 220 ft., will soon be completed and will be used for the immediate construction of 100 freight cars.

The K. O. Wetzel Co., Los Angeles, has been organized to operate an ornamental iron-working plant at 688 South Rio Street. Kurt O. Wetzel, 912 North Soto Street, heads the company.

The Moreland Truck Co., 1701 North Main Street, Los Angeles, is building a one-story foundry, about 60 x 120 ft., at its new plant at Burbank. Electric furnaces will be installed.

The Palau Metals Co., Los Angeles, has been incorporated with a capital of \$10,000 to operate a local plant. Charles A. Overmire, William Kennedy and Edward F. Flynn, Los Angeles, are the incorporators.

The County Engineering Department, Los Angeles, will build a new power plant at the county hospital to cost about \$30,000. Bids have been received.

The Los Angeles Pump & Supply Co., Los Angeles, has been incorporated with a capital of \$15,000. Edward M. Smith, J. W. Harasta and Louis O. Clewett are the incorporators.

The Pacific Northwest

SEATTLE, WASH., Oct. 2.

The Wilson Shipyards, Seattle, has been incorporated with a capital stock of \$30,000 by John Wilson, Edgar Ames, T. A. Jones, George Donworth and George W. Albin. It is completing a shipyard on West Waterway to construct and repair wooden ships.

The Treadwell Co., Douglas, Alaska, has awarded contract for an addition, 50 x 150 ft., to its foundry. The new equipment will include an electric furnace.

The Puget Sound Machinery Depot, Seattle, has let contracts for the erection of a new machine shop and warehouse to cost \$20,000, exclusive of equipment, which will more than double its present capacity.

P. X. Johnson and associates, Port Angeles, Wash., plan the construction of a factory at an estimated cost of \$10,000, to manufacture the Johnson plumb level.

It is reported that negotiations are under way for the consolidation of the Pacific Construction Co. with the Harrison & Lamond Shipbuilding Co., both of Vancouver, B. C., which provide for the construction of a plant to build wooden ships.

S. T. Carlett, of the New Idea Sheet Metal Works, Vancouver, B. C., has taken over the H. A. Slater Sheet Metal

Works and combined the two plants. New equipment will be added to manufacture heating and ventilating equipment.

Dan Kelleher, city purchasing agent, Portland, Ore., is advertising for bids for two 1,000,000-gal. multi-stage turbine pumps, 1,000,000-gal. water power pumping machine, and other equipment.

The Grants Pass Iron & Steel Works, owned by Hall & Fitzpatrick, Grants Pass, Ore., operating a foundry and machine shop, contemplate moving to Klamath Falls, Ore., to take care of shipbuilding demands.

The Pacific Car & Foundry Co., Seattle, has been incorporated for \$1,000,000 by William Piggot, president, James F. Twohy, vice-president, O. D. Colvin, treasurer, to build and repair cars, engines, etc.

Canada

TORONTO, Oct. 8.

Canadian trade continues in satisfactory volume and many industries are deriving considerable business from war orders. The United States Government has placed several contracts in the Dominion. The machine tool market is not very brisk, although the companies having contracts for 6-in. shells are buying a few special tools, but existing equipment will be generally utilized for the new work. New fixtures, however, will be required to suit the size of shells being turned out. A number of machine shops are busy on marine work. The Canadian Car & Foundry Co., Montreal, has purchased some of the new tools for its plant at Fort William, Ont.

The Wheeler Safety First Life Belt & Fireproofing Co., Ltd., Montreal, has been incorporated with a capital stock of \$25,000 by Jonathan A. McLean, Westmount, Que.; Joseph D. Lajeunesse, Gustave Adam and others to manufacture life saving equipment, fire proofing devices, etc.

The Central Iron Works, Ltd., Toronto, has been incorporated with a capital stock of \$100,000 by Arthur J. Thomson, 85 Bay Street; William S. Morlock, 107 Roxborough Avenue; Reginald H. Parmeenter and others of Toronto, to manufacture iron, copper, brass, machinery, tools, etc.

The Soo Pole & Tie Co., Ltd., Sault Ste. Marie, Ont., has been incorporated with a capital stock of \$500,000 by Harry F. Partridge, Minneapolis, Minn.; Edgar D. Alger, Sault Ste. Marie, Mich.; John L. O'Flynn of Sault Ste. Marie, Ont., and others, to manufacture lumber, timber, wood products, etc.

The Standard Foundry & Supply Co., Ltd., Walkerville, Ont., has been incorporated with a capital stock of \$40,000 by Frederick S. Ferguson, Tom P. Charlton, Gordon Ross, all of St. Thomas, Ont., and others, to manufacture iron, steel, brass, machinery, tools, etc.

The London Rolling Mills Co., Ltd., London, Ont., manufacturer of bar iron, steel, bolts, nuts, etc., has received permission to increase its capital stock from \$200,000 to \$500,000.

The Federal Government has taken over the ship repair equipment of the Lake Shipbuilding Co., Buffalo, N. Y., to be used in Montreal, for the purpose of rejoining Lake vessels that have been cut in two for the trip through the Welland and St. Lawrence canals.

The Canadian Leather Board Co., Chambly Station, Que., is in the market for shafting, pulleys and other equipment for its factory which is being erected at a cost of \$250,000.

Boilers, engine, generators, etc., are required by Stewart & Adams for the soap factory which is being erected for Henry K. Wampole & Co., Herriott Street, Perth, Ont. The plant will cost \$50,000.

The Canadian General Electric Co., Toronto, will build an addition to its plant at Peterboro, Ont., to cost \$40,000. E. G. Paterson is superintendent of the Peterboro plant.

The Romeo Foundry Co., Port Huron, Mich., is having plans prepared for the erection of a foundry at Sarnia, Ont., and will commence construction work this fall. It will manufacture automobile castings, etc., and will cost \$200,000.

The Packard Electric Co., St. Catharines, Ont., is in the market for a second-hand power squaring shear to cut No. 10 gage steel up to 24 in.

The Canadian Hanson & Van Winkle Co., Toronto, manufacturer of platers' supplies, etc., will erect two additional stories to its plant at 15 Morrow Avenue, to cost \$7,000.

The Coughlan Shipyards, Vancouver, B. C., at which six steel steamers will be constructed, four of which are under construction, will also build the boilers for the vessels and a permit has been taken out for the erection of a boiler shop.

The Weston Water, Power & Light Commission, Weston, Ont., will increase the capacity of the machinery in the substation by changing three of the present 50-kw. transformers for three of 100 kw. development.

